MEDICAL REPOSITORY,

FOR

AUGUST, SEPTEMBER, AND OCTOBER, 1804.

ARTICLE I.

Some REMARKS *on the* ORIGIN *and* PROGRESS *of the* MALIGNANT YELLOW FEVER, *as it appeared in the Village of Catskill, State of New-York, during the Summer and Autumn of* 1803, *in a Letter from Dr.* BENJAMIN W. DWIGHT *to* ENEAS MONSON, *M. D. of New-Haven, Connecticut.*

AS much pains have been taken, in various newspaper publications, to persuade the people of this country that the yellow fever is never of domestic origin, but an imported disease, I have been induced to state to you some facts which appear to me to support the contrary opinion. It was originally my intention to state, generally, the existence and progress of the disease in this place, during the summer and autumn of the present year, and the manner in which I conceived it to originate; but as I have been informed that some gentlemen, who discover the nature of yellow fever by intuition, and not by observation and reasoning, have doubted the existence of the disease in this place, or have determined, if it did exist, that it must have been imported, I have thought it advisable to state *particularly* some of the first cases which occurred, that every one may judge for himself whether it was yellow fever or not.

The attending physicians were of one opinion as to the nature and origin of the disease. If they were mistaken in their opinions, then the following observations will avail nothing as to the point in debate. If their opinions were correct, then I flatter myself that it will unanswerably appear, from the following observations, that the malignant yellow fever may be, and has been generated here. That its origin is always *domestic*, I am far from believing. That it is sometimes *contagious*, there appears to be good evidence. An instance or

or two of its contagious nature I could produce. That it was contagious in any instance here, the present season, there are no good grounds for believing.

The question is very important to be settled. If the disease is imported, the strictest quarantine laws should be made, that this fiend may be prevented from again landing on our shores, and brandishing the sword of destruction over our heads. If it is generated among ourselves, it is a duty incumbent on the legislature to compel people every where to remove all filth, to root out, so far as is practicable, all the causes of vegetable and animal putrefaction, and to cherish cleanliness as a cardinal virtue.

If ever the question is decided, it must be by facts. One important fact is of more avail, and will have more weight with candid men, than all the hypotheses even of the learned Haygarth, or any other the most ingenious physician or philosopher that ever lived. To facts then be the appeal.

Previously to entering upon the subject, I shall make some observations upon the local situation and circumstances of Catskill, and also upon the weather of the summer and autumn. I regret that these will not be more complete. Having resided in the place but a few months, I have not been able to possess myself of all the facts which it might be interesting to know. For a number of them, it is with pleasure that I acknowledge myself indebted to my worthy and ingenious friend, Dr. Croswell.

The village of Catskill, or, as it is usually called in the neighbourhood, *Catskill Landing*, is situated along the Catskill Creek. This creek empties into the Hudson about six miles below the city of Hudson, and 125 above New-York. Catskill Creek is formed by the junction of the *Kaaters'-Kill* and the *Kaats'-Kill*,* two streams of moderate size; the former of which, and not the latter,† as is erroneously stated in the Medical Repository, Hex. I. vol. i. p. 310, arises from a pond or lake in the Blue Mountain, and, pursuing a serpentine course, empties its waters into the Kaats'-Kill about three miles from the mouth of Catskill Creek. The latter, if I am correctly informed, arises from a swamp called by the Dutch *Eckeson Fly*, in the town of Middleburgh, in Scoharie county, and proceeding also in a serpentine direction through Bristol, Ren-

* This is often written Catskill.

† The author might have seen that this mistake was corrected long ago, if he had examined Med. Rep. Hex. I. vol. iii. p. 335.—E.

sellaerville, Freehold, Canton, and a part of Catskill, unites with the Kaaters'-Kill. The Kaats'-Kill is the largest stream. Both have rapid currents, and in many places rocky bottoms. In both are a number of falls of considerable size and importance; some of which are in no small degree interesting and remarkable.

The creek has a bar of sand at the mouth, over which, in common tides, there is about nine feet of water. This bar is the commencement of a small island, situated in the Hudson, a little north-east of the mouth of the creek. Were a wharf erected, extending from the main land, i. e. from Catskill Point, to and along this island, any ship which could pass the mouth of the Hudson might come to Catskill with entire ease and safety, and be hauled along side the wharves. Whenever this is done, the growth of Catskill will probably be rapid, as few towns on the Hudson are so advantageously situated for commanding the trade of a great portion of the western country.

The creek, tracing it from its mouth, proceeds in a north-western direction about three-fourths of a mile. It then takes a turn nearly west, and proceeds in this direction thirty or forty rods. After this it takes a second turn nearly north, and proceeds in that direction about three-fourths of a mile. To trace it further is of no consequence to the present design. It is navigable for vessels drawing twelve feet of water about a mile from its mouth, if they can be got over the above-mentioned bar. About a mile from its mouth there is another bar; but sloops of 100 tons may easily pass sixty or eighty rods further. The tide rises, at common tides, from four to six feet, as far up as Van Vechten's mills, about two and an half or three miles from its mouth. About one and a quarter or half miles from its mouth there are rocks and small rapids which obstruct navigation.

The creek is of different widths in different places: it is generally from twenty to forty rods wide from its mouth to that place where the rocks and rapids commence. After this it is narrower. The current is brisk. There are no low swampy places along its banks, where the water stagnates; the banks being generally abrupt, and considerably higher than the surface of the water.

The water of the creek is soft, and makes a good lather with soap, and is generally used for washing by the inhabitants.

Including dwelling-houses of all descriptions, there are more than a hundred in the village, and also a considerable number

of stores. These, excepting about six or eight, are situated on the east side of the creek, and principally along one street. This street commences at the bank of the Hudson, and runs about 100 rods in a N. W. direction, near to the creek. Where the creek takes the first turn, as above-mentioned, the street is changed from a N. W. course, to one near N. and continues in this direction about half a mile. This part of the street is, *generally*, from ten to thirty rods distant from the creek; in some places the distance may be forty rods. After this, the road takes a second turn nearly west, till it reaches the bank of the creek, and then pursuing a general north-western *direction*, is continued on the great western turnpike, leading to the Susquehannah river. Where the creek makes the first bend, there is also a short street running nearly parallel to it. On this street stand several houses, and between the houses and the creek a few stores. The ground on which these stores stand, is partly or wholly made ground. At this bend of the creek, a kind of basin is formed, and several families live, as it were, on its brim; or, in other words, some of the houses are situated upon the edge of the bank, or directly down it, one end being at the top, the other end at the bottom. Let this place be remembered, for here the sickness commenced, and around here it made all its ravages. There are some other cross lanes where houses and stores are situated. A number stand near the creek, on no regular street, and a few scattering ones are to be found elsewhere.

That space, or portion of ground, between the east side of the main street and the creek is low, and nearly level, but there is a gradual descent sufficient for conducting off all water to the creek. The eastern side of the street, throughout its whole extent, is bounded by the foot of a hill of some height. This hill has a pretty steep ascent; its height is generally, I should suppose, from fifty to a hundred feet. The northern part of the village is likewise bounded by hills of about the same height. On the western side of the creek, for the space of nearly a mile, the hills are high, and approach close to its edge, there being little or no flat. Above this, the ascent is small. The present settlement is almost entirely hemmed in by hills. The circulation of the air in the summer and autumn is, of course, often languid, and the heat and sultriness of the weather is unpleasant and relaxing.

The soil, both on the hills and in the plains, is, generally, a very fine clay. There are some small patches of loam and sand chiefly on the hills. When a rain falls, the water, instead

of settling in the ground, descends in a considerable measure into the flat, and from thence into the creek, or what is not unfrequently the case, settles in the gutters and sunken places in the streets and elsewhere. Here it continues in hot weather till it is evaporated by the heat of the sun. In the course of a few days it becomes covered with a green scum, which is putrid and highly offensive, so as not unfrequently to excite disagreeable sensations in the head and stomach. In long-continued hot weather, preceded by considerable rains, and aided by other local causes, some severe cases of sickness have, in several instances, been in this way produced. All this might have been prevented by a little pains-taking. By making a sufficient number of sluices, and keeping them free from obstructions, the water might easily be conducted into the creek, and in its course be very advantageously made to cleanse all sewers and drains for conducting off filth.

The well-water in Catskill, and generally in the neighbouring country, is very indifferent. Most of it, as far as my observation has extended, is hard, and abounds in hot weather with animalcules, in shape resembling tad-poles, and not unfrequently with small worms. After standing a little time, it deposits a clayey sediment. By drawing out the water freely, it may be much improved in softness and purity. Possibly all these evils might be remedied, by placing a layer of sand on the outside of the stones, a foot or two in thickness, and extending from the bottom to the top of the well; and another layer at the bottom of the well. This I suggest merely for experiment. I know not that the trial was ever made.

A free use of the water, as drink, is very apt to induce troublesome diarrhœa, especially with such persons as have resided here but a short time.

The people of Catskill live very much crowded together, most of the houses containing two, three, four, or more families.

The number of inhabitants in the village, or in the town of Catskill, which includes *the landing*, Loonenburgh, and several small settlements, cannot be ascertained. The late census, it is said, was very inaccurately taken.

This place is usually as healthy as most other places situated along the Hudson. Albany, Loonenburgh, and Hudson are probably quite as unhealthy, if not more so. Some cases of bilious remitting fever occur almost every season, but they are not usually more frequent, nor attended with more severe symptoms, than the same disease is elsewhere. In a few in-

stances there have been cases of malignant fever, but never any considerable number previous to this season. In most instances they have clearly been owing to local causes, and have generally been confined to those places where such causes operated in an especial manner. Till the present year, the greatest number of cases have occurred in places considerably remote from the wharves. The reason is obvious. In addition to the stagnant waters in the gutters, &c. as above-mentioned, not more than two years ago a slaughter-house was opened near the middle of the main street, a little east from the road. Here a large number of sheep and neat cattle were slaughtered during the summer season. All the offals were thrown into the yard, and lay there from season to season. After every rain, the water which proceeded from this yard ran into the street, and there became either partially or wholly stagnant. In the neighbourhood of this sink of filth and poison it has, in several instances, been very sickly. Some cases highly malignant have, at times, occurred. In one small house, in particular, so situated as to take more of the stench than any other, Dr. Croswell informs me, that the number of cases of severe sickness, during the existence of this evil, among the several families who have resided in it, have been very remarkable. He could generally determine before-hand, from the weather, and the state of the slaughter-yard, and the sewer leading from it, whether these families were to be visited with sickness or not. Some other causes of a similar nature have, at times, existed in other parts of the village, and produced sickness. In those places free from such nuisances, it has, in general, been very healthy. The present season these evils have ceased to operate. The weather also, from being very dry since about the middle of August, has been unfavourable to the putrefaction of animal and vegetable matter. The consequence has been, that every part of the village, except the one above-mentioned, has been very healthy. Could the town of Catskill obtain an act of incorporation, with an energetic police, it would be of no small benefit.

Had the inhabitants, instead of seating themselves on the flat land by the creek, erected their dwelling-houses on the hills, surrounding them in front, with clean and spacious court-yards, ornamented with trees, and, in the rear, with good gardens; they would have enjoyed, in addition to a very romantic prospect, an atmosphere seldom exceeded in coolness and purity, and would have lived much more pleasantly in a variety of respects.

Building on the hills has been lately commenced; and the example being set, it will probably be followed by many others.

A predisposing cause, of no inconsiderable power to the diseases of autumn, may be found in the diet of a considerable portion of the inhabitants. Not a small number eat much too freely of *fresh meats;* the market for vegetables is, at times, badly supplied, and many families are in a great measure destitute of gardens; hence they do not use a sufficient proportion of vegetable aliment. Very little cider or good beer is made in this part of the country, of course ardent spirits are used much too freely. The markets, however, in these and other respects, are rapidly improving, and the probability is, that in a short time the supply will be abundant.

Weather.

I proceed now to make a few observations upon the weather. These will necessarily be incomplete. No thermometrical observations are made in the town within my knowledge. Previous to the month of July, a day or two before the commencement of which I arrived here, the state of the weather is unknown to me. Some of the observations which I noted down from time to time since then here follow.

During the first week in July, the weather was warm, the sky clear, the ground dry. From this time to the 22d, it was, with very little exception, intensely hot. I have no recollection of any such long-continued period of extreme heat. The sky was clear, little or no rain fell during the whole time, of course the ground became much parched. The crop of hay in the country around was greatly cut short, in consequence of the drought. From the 22d the weather became cooler, and continued so for a few days. A considerable quantity of rain fell on the 24th. From this time to the 30th it rained every day, and several days largely, so that the earth was soaked with water. During this period also, there was considerable lightning and thunder.

August. From the 1st to the 18th a great quantity of rain fell. During this period it rained oftner than every other day. It descended not in what are called settled rains, but in sudden, and, in some instances, heavy showers, of which there would frequently be several in the course of the day. After the sky became clear, the weather was hot and sultry, the rains not serving to cool and purify the atmosphere at all. The common remark of the inhabitants was, that there was no elasticity in the air. Though I have said that the weather was hot, yet,

during the latter part of the time, there were several very cool nights, succeeded by damp, chilly, foggy mornings, the middle of the day only being very hot. From the 18th to the 25th the evenings and mornings were very cool, and generally very damp, and in several instances there was a thick fog. The 20th there was a white frost on some low grounds in the village. The sky, during this period, was generally clear, but several days it was partially overcast with clouds. From this time to the 30th, it was clear and very hot during the day; the evenings were damp and chilly; no rain has fallen since the 18th. From the 30th of August to the 12th of September the weather was cool, but the difference between the heat of mid-day and the coolness of the evening was great; so that a change of clothes was very pleasant. From the 13th to the 20th the weather was warm in the middle of the day, and cool in the morning and evening. The 18th and 19th there were white frosts. From this time to the 25th it was warm—the remainder of the month was cool. All the rain that fell from the 18th of August to the 26th of September did not wet the earth two inches. The 26th a moderate rain.

In the month of February, Dr. Croswell informs me, the Scarlatina Anginosa began to prevail. It gradually increased till the month of March, when it was uncommonly rife; after this it generally decreased till it disappeared in May. A great number of children, and a considerable number of adults had the disease. It was not malignant, only one person having died of it. The local affection in the throat was, in some instances, however, considerably severe.

In May and June, intermitting fever was uncommonly frequent. More instances of it occurred at this time than during the three preceding years. It yielded very readily to the bark.

In the month of July, a considerable number of cases of cholera infantum occurred, and among adults a few cases of dysentery; but these diseases were neither more prevalent nor malignant than they generally are in this place at the same season of the year.

In the month of August, the epidemic, which is the subject of the following remarks, commenced its career. The two first cases occurred on the 10th; the third and fourth on the 11th; the fifth and sixth on the 19th. The four persons who first had the disease, were seized within twenty-four hours of each other. The three who were first seized lived in one house, and they composed the whole of the family at that time.

The first person attacked was Mrs. H. This case I shall relate with a degree of minuteness that may seem to some persons tedious and uninteresting. This I shall do, because the case appears to me interesting in itself, and because it is of importance to establish the nature of the disease.

Case I.

Mrs. H. about forty years of age, has a large frame, but is of a delicate and irritable habit. She has been heretofore much troubled with flatulency and other symptoms of dyspepsia. She began to complain, Wednesday, August 10th, of general indisposition, such as languor, lassitude, want of appetite, and other symptoms, such as usually precede fevers. Not long after, a chilly fit came on. The symptoms soon becoming more urgent, Dr. Croswell was sent for. He saw her about eleven o'clock A. M. Her pulse was very full, quick, and hard for her habit; her face was considerably swollen and much flushed; her eyes of a fiery red, the vessels being turgid with blood; her tongue was moist and covered with a whitish furr; there was a stinging heat in the skin. She complained of great pain in the fore part of the head, and in the eyes, and about the loins; she was exceedingly restless and uneasy, anxious and desponding; her abdomen was swollen and tense; her distress at the stomach was very severe; she eructated much gas, and constantly called for cold water. He ordered an injection, and administered a dose of calomel

At five o'clock P. M. Dr. C. having ridden out of town, I was sent for. All the above-mentioned symptoms prevailed to a great degree. She said that she was in no respect easier than in the morning, but rather worse. The injection had operated once or twice, the medicine had not. What medicine had been given, or what purpose it was intended to answer, I could not learn. From the swollen face, the excessive uneasiness at the stomach, and the frequent retching, I was inclined to think that some poisonous substance had been taken into the stomach, and ventured, notwithstanding the distension of the abdomen, &c. to prescribe an emetic of *Tart. Emet.* and *Ipecac.* At this time came in Dr. C. and approving of what I had done, the emetic was accordingly administered. It did not operate well, though it was apparently of no disservice. The calomel which she had taken in the morning soon after operated freely, but her distress and uneasiness were not at all relieved. Not long after Dr. C. administered a small opiate, and made free use of the Aq. Ammon. Acet. made with a consider-

able prevalence of the alkali. Thursday, 11th, he commenced the use of calomel in small and frequent doses, and continued the Aq. Ammon. Acet. Friday, 12th, at three P. M. I visited her in consultation. She was still very restless and uneasy, and complained of excessive burning and extreme sickness at the stomach, and made frequent efforts to vomit, and occasionally puked a little greenish matter, which was exceedingly acrid. The inflammatory symptoms were, however, evidently abating. We continued the calomel, and, instead of the Aq. Ammon. Acet. commenced a very liberal use of Sal. Tart. This had an excellent effect. It relieved to a very considerable degree the extreme sickness and burning pain in the stomach, which no other medicine appeared to affect at all.

Her drinks were toast water, rice water, and chicken water; in the last of which a strong solution of Sal. Tart. was administered frequently, and in liberal quantities. The chicken water sat easier upon the stomach than any other food.

In forty-eight hours from the time of seizure, the furr flaked off from the tongue, and left it very red and dry.

Saturday, 13th. She appeared considerably better; her pulse was nearly natural; her countenance had become considerably clear; she was much less restless and desponding; her stomach was less irritable; she conversed rationally. At this time considerable yellowness appeared in her eyes, and a less degree of it over her whole face. We ordered the medicines which were prescribed yesterday to be continued.

Sunday 14th. In the morning she appeared to be still mending. She was nearly or quite free from fever. In the course of the afternoon she became very anxious for her husband, who was severely sick with the same disease. Monday morning her anxiety, on this score, greatly increased. His death, which happened in the afternoon, agitated her exceedingly. At two o'clock P. M. the countenance had assumed a dingy appearance to a considerable degree. This afternoon she vomited a considerable quantity of black matter resembling coffee grounds. Soon after her vomiting ceased, a violent *hemorrhagia uteri* came on. It was at first very offensive, and in clots. It afterwards became of a more healthy appearance.

Tuesday, 16th. She was extremely feeble and languid; her pulse was frequent and thread-like. Her drinks were chicken broth and porter, wine and brandy, as much of any of them mixed with water as she could be persuaded to take. Her medicines were Spt. Mindr. and occasionally alkalies, and as necessity indicated, opiates.

17th. Her situation was similar to that of yesterday. On the 18th her hemorrhage ceased, and her pulse flagged exceedingly, so that she appeared to be on the very borders of death. For three or four days she has lain constantly on her back, with her knees drawn, and whenever she fell asleep, her feet slipped down over the end of the bed. To-day she sleeps with her eyes half closed, and her chin fallen. She has had two or three stools every day for some time past, naturally, or procured by injection. Soon after the hemorrhage had wholly ceased, the black-vomit came on again, resembling very exactly coffee grounds, except that it was of a little darker colour. On the 20th she had black-vomit which resembled soot sprinkled in mucus, and diluted with water; it was also somewhat flaky.

21st. This morning her tongue was covered with black furr, and black matter appeared around her cheeks and gums. She vomited some blood, as the nurse said, the last night or this morning, and in the evening had a return of the black-vomit. Her perspiration is of a highly cadaverous smell. She is troubled occasionally with singultus, but it is chiefly after taking drinks. She has been frequently delirious within the three or four last days. It was not a delirium of the wild ferocious kind; it resembled silliness or fatuity. She takes nothing except the Tint. Opii. and brandy and water. Her respiration is very deep, slow and heavy. The interval between each respiration was about half a minute, her breast rising very much. During the day she made several attempts to get up and walk about the room.

23d. Her hemorrhage returned; she takes no notice of any thing whatever. About this time an enlargement and induration of the right parotid gland took place, and pretty rapidly increased. Dr. White, of Hudson, who visited her in consultation with us, advised fomentations of warm brandy and vinegar from her feet to her neck. This was done and repeated once or twice.

24th. Her pulse is fuller, stronger, and more regular than yesterday: her tongue is furred: a feverish heat exists in the skin: she complains of great soreness in the throat, and difficulty of swallowing: she hiccoughs occasionally: her perspiration is cadaverous to a very uncommon degree: her mind is quite rational. During the following night the symptoms were more unfavourable than ever. In addition to great debility, she was very incoherent in her ideas, was troubled with frequent hiccoughing, and constant uneasiness at the stomach:

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her throat grew more and more sore; and her tongue began to assume an aphthous appearance.

25th. This morning she appeared in all respects better, except about her tongue and throat: her pulse is quite regular, is not very frequent, and has considerable firmness: her skin is temperate: her respiration is less difficult: her countenance has some degree of animation in it, she is entirely rational: has had natural stools yesterday and to-day: she had her clothes changed without inconvenience, and relished a cup of coffee; but her tongue was more aphthous. In the evening her pulse was much feebler, and her tongue was covered with aphthæ. To relieve this complaint various gargles were used, but none answered so effectually as strong gargles of yeast, or yeast mixed with sage tea. Between this time and the 27th two or three distinct crops of aphthæ successively sprung up, and were subdued. Her throat became extremely troublesome. She had a constant drivelling from the mouth of tough mucus, which was exceedingly nauseous and offensive. The parotid gland had become as large, or larger, than a hen's egg, and very hard: her countenance had been gradually changing from a dingy hue to a deep yellow. Her urine, for a week or more, has been of the colour of strong ley.

29th. She is very uneasy at the stomach, owing, as she supposes, to the mucus from her throat getting into her stomach during sleep. This uneasiness was considerably relieved by alkalies and epispastics. In the course of the forenoon she voided several times urine of a deep green colour. Several persons who saw it, and one of them a lady very intelligent and accurate in her observations, compared it to the colour of the leaves of the yellow pine, or to the dye which is sometimes made in this part of the country from the leaves of hickory. In the afternoon she voided some of a less green colour, part of which I saw. Its colour resembled very exactly that kind of green which the leaves of Indian corn often assume after a drought, in the months of August or September, and which the corn in this part of the country had at this time assumed. It was as thick as common mucilage of gum-arabic. Into a small quantity of it we threw a few grains of the vegetable alkali: no effervescence took place. In the course of the day she expectorated two or three tough pieces of concreted mucus, resembling the membrane which is sometimes thrown off from the larynx in cynanche trachealis. In the evening the uneasiness of the stomach increased. Alkalies were continued, and a gentle cathartic of

pulv. rhei. and *tart. vit.* administered, and an epispastic applied upon the abdomen.

31st. Her tongue is putting on a natural and healthy appearance: her eyes had become of a deep orange-colour, and glassy.

September 1st. She informs me that, from the time she was taken sick to within about four days, she had no recollection of any thing that had passed, excepting a single circumstance respecting her husband's death. From this time she continued to mend slowly: her appetite and strength began gradually to return. She took freely of columbo, bark, wine, &c. In a few days she got quiet sleep without opiates; 13th she rode out; and now, Oct. 10th, enjoys good health.

The enlargement and induration of the parotid gland excited considerable uneasiness and apprehension. At times it was considerably painful, particularly internally. Mercurial frictions were applied below it freely, and after some time it dispersed.

Case II.

The second person who was attacked with this disease was Mr. H. a respectable merchant in this place. He was forty-four years of age, tall, large, and well-proportioned: he was very muscular, and possessed a vigorous habit: his pulse was naturally very full, slow and regular. For several days previous to his sickness he complained of being slightly indisposed; and his brother, who was accustomed to do business with him daily, informs me that, for a week before his seizure, his breath was extremely offensive to the smell. So much was this the case, that he repeatedly advised his taking medicine, lest he should become sick. Wednesday, August 10th, in the morning, he sailed in a sloop up to Hudson. The weather was very hot and sultry. Having considerable business to transact, he walked up and down Hudson streets till he was much fatigued. In the afternoon he spent a little time with some friends, and was unusually cheerful and animated in his conversation. He returned on board the sloop between eight and nine o'clock in the evening. It was damp and chilly on board. She lay becalmed in the river several hours. About ten o'clock he was seized with a severe chilly fit, which was soon followed by great pain in the fore part of the head and eyes, in his loins, hips, and thighs; but it was most severe in his knees, and in that part of the leg where the gastrocnemius and soleus muscles unite to form the tendo-

achillis. The pain he described as being more severe than all that he had suffered in his life before. Early the next morning, viz. August 11th, the vessel returned to Catskill, and he was brought home. About eight A. M. he sent to Dr. Croswell, who found him with a pulse full, slow, and hard: his tongue was covered with a pretty thick whitish furr: he complained of great pain in those parts of the body before mentioned, but said it was less severe than last night: *his face was considerably swollen* and flushed: his eyes were of a fiery red colour, and greatly pained by light: his skin was very hot: he was extremely sick at the stomach, and complained much of a burning heat in that organ: his bowels were costive.

The Doctor administered an emetic of *tartar emetic* and *ipecac. pulv.* which operated very well, and brought away a considerable quantity of bile. After a proper interval he gave him a liberal dose of calomel, and a second dose in the afternoon: it purged him considerably, but it brought away but little bile. After its operation was over he passed scybals in considerable quantity.

Friday, August 12th. This morning calomel and castor oil were administered, and operated pretty well. I saw him in consultation, at three o'clock P. M. His pains were much less severe: *his face was much swollen*, so that his eyes were half closed. This was so remarkable that every person who came in observed it, and concluded that all the family must have been poisoned. His skin was hot and dry: his tongue was covered with a thick whitish furr: his pulse was very irregular. The first three or four strokes that I felt were full, slow and hard: to these succeeded a quick small pulsation, and then a limping or hobbling pulse. Upon examining it a little longer, we found that it was not regular in any respect. The hobbling stroke, however, occurred as often as in one pulsation out of five.

Dr. Rush has, in some one of his works, mentioned a pulse of this kind. How he defines it I do not recollect; but in this patient, in whom I observed it frequently, it seemed as though, during the first part of the stroke, there would be a regular full pulsation, but it soon dropped away, and the remainder of the stroke was small, and dragged feebly after. He was very uneasy and restless, was troubled with constant nausea, frequent retching, and occasionally with vomiting. He was continually tossing from one side of the bed to the other; and was considerably stupid. It appeared as if the miasmata which produced the disease had acted with so much virulence and

force as to produce, in a great measure, a prostration of excitement.

The propriety of blood-letting was canvassed, but it was thought prudent to defer it. Calomel was ordered in small and frequent doses. The Spt. Mind. and occasionally alkalies, were made use of to relieve the stomach sickness. His drinks were the same as in Case I. but chicken water appeared to sit easier upon the stomach than any thing else.

Saturday, 13th. He was in no respect altered for the better, except that he had little or no pain. He was very uneasy. For a minute or two he would sit up, then lie down, and toss about the bed, seeking to find some relief from a change of posture. The whites of his eyes were considerably yellow. His pulse being still too active, blood-letting was again proposed, but it was thought prudent to defer it for a few hours, to take the exacerbation. No distinct remission had taken place since the commencement of the disease, and nothing like exacerbation took place to-day, except that, about twelve o'clock, the face became a little more flushed.

Dr. Croswell bled him at this time in the arm, from a large orifice, about ℥ x. The blood flowed freely. Three hours after, on examining it, we found a thin, dense, livid skin on it, extending over the whole surface. There was not the least separation of the serum and crassamentum. The whole mass was of one uniform appearance and consistence, soft and fragile like dissolved blood. The skin was removed, and some hours after there was about a tea-spoonful of a highly yellowish serum separated, and the mass was a little more firm. It never assumed a florid colour at all. From this may we not infer that a certain healthy state of the blood is necessary in order to imbibe oxygen, or that there is some principle in the blood capable of being destroyed by disease, which, in combination with oxygen, is necessary to produce the red colour of the blood?

His pulse, for two or three hours after bleeding, was regular, soft, and slow; in other words, it was nearly or quite natural. It then became one-third more frequent, and less full and tremulous. This afternoon, after taking some Spt. Mind. and drinking a little beer, he vomited some dark-coloured matter, of a flaky appearance; his stupor greatly increased. Vigorous efforts were made to salivate him. Sinapisms were applied to the feet, and large epispastics to the abdomen and neck. They produced some redness in the skin, but no lymph was raised, except here and there a little of an orange colour.

This afternoon entire suppression of urine came on, and no stools could be obtained either by cathartics or the most stimulating injections, though both were administered liberally.

Sunday, 14th. In the morning his stupor had increased almost to coma. A streak of a dingy hue ran up each side of his face, from his neck along the back part of the under jaw to the temple. He had no stools nor urine pass to-day: his tongue had never cleared at all, except that a piece about as big as a half-dime peeled off, and left it red and dry underneath.

Monday morning, all his symptoms were much aggravated. His throat became exceedingly sore, so that he could not swallow a tea spoonful of water without great agitation, and threatning symptoms of strangulation; his respiration was very difficult, and soon became extremely laborious indeed. Subsultus tendinum came on early this morning, and increased till every part of his body was affected with violent convulsions, and he died in vast agitation about four P. M. His face had become of a dirty yellow colour.

Case III.

Emma, servant in Mr. H.'s family, was next attacked with this disease. She was taken sick early in the morning, August 11th. I saw her but twice, and cannot describe her case minutely. Dr. C. informs me, that she complained of great pain in the fore part of the head, and in the eyes, loins, and hips; that her eyes were very red; that she complained much of sickness at the stomach; that her fever was dispossessed of alternate *remissions* and exacerbations: in short, that it was a clearly marked case of yellow fever, but less violent than either of the preceding cases. She was entirely recovered in ten or twelve days.

Case IV.

About the same time that Emma was seized, Conright Briggs, a ship-carpenter, began to complain of the symptoms of this disease. I did not see him at all during the month of August. Dr. C. considered his as a decided case of the disease. After some time he began to convalesce, and as he recovered his health he used ardent spirits much too freely. He gained strength very slowly indeed. Thursday, the 8th of September, he was employed a considerable part of the day in hunting, in consequence of which he became much fatigued. Sunday, 11th, he walked about town most of the forenoon, making preparations for a journey. The weather was hot,

and he complained of being much wearied. About half past four P. M. he was seized with fever. I saw him at this time. His pulse was considerably full, hard, and frequent. His eyes were of a dull, or, perhaps, more properly, of a *yellowish* red: his face was much flushed: his skin imparted a sensation like the incipient stinging of nettles: he complained of no pain or sickness at the stomach, but he was very restless, uneasy, and desponding, and continually tossing about the bed: he was also unusually stupid. His bowels, he said, were very free, and had been so for several days. A small quantity of tartar emetic in solution was administered, together with some warm drinks, which soon sweated him. About an hour after I called in again: he lay quiet, and said he felt much easier, and recollected that he had had no stools within two or three days. Calomel was given to operate as a cathartic, and afterwards in small and frequent doses, so as, if possible, to affect the system. I saw him occasionally after this, but not regularly. In the evening entire suppression of urine took place. During the next evening, viz. 13th, he was affected with black-vomit to a great degree. On the morning of the 14th he threw up an enormous quantity of it. At this time he was extremely stupid. About eleven o'clock A. M. he said he felt much better, and was hungry, and called for some bread and meat. Some person gave him some toast and water, of which he ate a little. He almost instantly became very uneasy. I saw him about this time. He appeared to be much distressed. His eyes were very yellow: his countenance had assumed, to a remarkable degree, that tawny hue so frequent in yellow fever: his extremities were cold, and bedewed with clammy sweats: he was affected with violent subsultus tendinum, and died shortly after.

(To be continued.)

ARTICLE II.

Partial CATALOGUE *of the* BIRDS *of New-York, made by* SINGLETON MITCHILL, *Esq. at Plandome, and communicated to Dr.* MITCHILL, *in a Letter dated July* 5, 1803.

I HAVE bestowed considerable time and care in forming the list of birds hereunto annexed. All the sorts therein mentioned are to be seen in the course of the seasons at Plan-

dome, along its shores, and in the adjacent territory. We have as large a collection I believe as any plantation or neighbourhood in the United States can count. There are many others which reside on Long-Island, or visit it, that do not show themselves hereabout, but are to be found to the southward and eastward. These I have not mentioned. And I have also omitted a few of those we have here, because I am ignorant of any names by which to distinguish them. As far as the catalogue goes, I believe it correct, as it contains not a single bird of the whole 123 species that I have not seen in this vicinity. I am not certain, however, that I may not have reckoned one or two species twice, from not distinguishing perfectly between the male and female.

Large white owl,
Hooting-owl,
Screech-owl,
Barn or mouse-owl,
Grey-eagle,
Bald-eagle,
Fishing-eagle,
Hen-hawk,
Chicken-hawk,
Duck-hawk,
Pigeon-hawk,
Rat-hawk,
Bird-hawk,
Pale blue coloured hawk, with tip end of wings black.
Fish-hawk,
Night-hawk,
Common crow,
Blue-jay,
Crow, black-bird, or jackdaw,
Black-bird,
Red-wing'd black-bird,
Yellow-wing'd black-bird,
Ground black-bird, or bob-lincoln,
Mocking-bird,
King-bird,
Brown-thrush,
Wood-thrush, or Chaweet,
Robin-red-breast,
Goldfinch,
Hang-nest,
Fire-bird, or wood red-bird with blue wings,
Indigo-bird,
Cat-bird,
Cedar or crown-bird,
Pheasant,
Quail or partridge,
Goldfinch yellow-bird,
Smaller yellow-bird,
Phebe-bird, or pewee,
Cuckow,
Large crested wood-pecker, with white back,
Red crested spotted wood-pecker, or clape,
Red-headed wood-pecker,
Large speckled wood-pecker,
Small speckled wood-pecker,
Crested king-fisher,
Humming-bird,
Ground-dove,
Wild pigeon,
Meadow-lark,
Lark snow-bird,
Winter sparrow,
Brown hedge sparrow,
Brown white-throated sparrow,

House sparrow, or chipping-bird,
Cow-bird, or fly-catcher,
Blue-bird,
House-wren,
Meadow-wren,
Small-crested wren,
Chimney-swallow,
Barn-swallow,
Bank-swallow,
Black martin,
Bat,
Whip-poor-will,
Large white heron,
Small white heron,
Large blue heron,
Small blue heron, or crane,
Quock, or crested blue bittern,
Skouk, or green bittern,
Meadow-hen, or marsh bittern,
Large curlew,
Lesser curlew, or merlin,
Wood-cock,
Blind snipe, or English snipe,
Field or teeter snipe,
Kill-deer snipe,
Robin snipe,
Yellow-leg snipe,
Ox-eye snipe,
White snipe, with clouded wings,
Willet, or humility,
Beach snipe, or sand-bird,
Grey wild-goose,
White wild-goose,
Brant,
Black duck,
Grey duck,
Wood duck,
Pile-start,
Old-wife,
Dipper, or dopper,
White widgeon,
Grey widgeon,
Broad-bill,
Large black coot, with white head and red bill,
Small coot,
Shoal-duck,
Sea-bat,
Blue-winged teal,
Green-winged teal,
Cormorant,
Large spotted loon,
Small spotted loon,
Small brown loon,
Penguin,
Pyed Sheldrake,
Brown Sheldrake,
Water-hen, or hell-diver,
Large white gull,
Large grey gull,
Small white gull,
Small white gull with grey wings,
Summer gull,
Large sea-swallow,
Small sea-swallow,
Shear-water, or razor-bill,
Chattering plover, or kill-deer,
Green plover on the plains,
Grey plover, or frost-bird,
Black-breasted plover.

ARTICLE III.

REPLY *to the preceding* COMMUNICATION; *containing Observations on certain Species of Game-Birds, and on the Names by which they are distinguished among Sportsmen. Dated New-York, June* 10*th*, 1803.

THERE is such a confused dialect in use among our sportsmen, that, as you observed to me, on so common and so fashionable a subject as fowling, it is pity that any uncertainty should remain. Your fondness for shooting, and your skill in finding, distinguishing, and killing the birds you hunt, will probably render acceptable the following remarks on game. For when *you* are in quest of game-birds, the words of the most charming of rural poets may be quoted as peculiarly applicable:

> " Nor on the surges of the boundless air,
> Though borne triumphant, are they safe: the gun,
> Glanc'd just and sudden from the fowler's eye,
> O'ertakes their sounding pinions; and again
> Immediate brings them from the towering wing
> Dead to the ground; or drives them, wide-dispers'd,
> Wounded, and wheeling various, down the wind."

There are two game-birds which are frequent in the greater part of our associated States, and are known by three different names. These are the *pheasant* and *partridge* of Pennsylvania, and the *partridge* and *quail* of New-York. According to the way of speaking in these two States, there are no quails in Pennsylvania, and no pheasants in New-York; while in both places they acknowledge the partridge.

It is known, however, that the Pennsylvania partridge is exactly the New-York quail, and the pheasant of the former is precisely the partridge of the latter. Hence the inhabitants of the cities of New-York and Philadelphia cannot converse together intelligibly without making allowances for this difference of meaning. It is a pity that, on a plain question of natural history, the language should be so dissimilar. A moderate degree of consideration will show what the truth is, and by what names these birds, so famous among sportsmen and epicures, ought to be called. It will be clear, on examination, that the quail, partridge and pheasant of Europe and Asia do not exist in America, or certainly are neither of them the birds in controversy.

The bird which the New-Yorkers call the partridge is the Tetrao Cupido of Linnæus. And they who have frequented the Philadelphia market know that the same is also the Pennsylvania pheasant. The proper name of this bird is neither one nor the other of these terms. It ought to be called the "pinnated grous," from its having a large tuft of feathers on each side of his neck, and being of the grous family. Or if he should still be called by the old name, it ought to be qualified by the epithet *Fredonian*, or something of the sort, to distinguish him from the rest of the tribe.

The fowl which the Pennsylvanians call the partridge, and the New-Yorkers the quail, seems to me to be the Tetrao Virginianus of Linnæus. He might be called the New-England or Virginian quail, to distinguish him from the partridge and quail of Old England, which are very different creatures from him.

The quail of Europe is the Tetrao Coturnix of Linnæus, and is not found in America, at least not in the Fredish dominions. And that our New-York, New-England or Maryland quail is different from that of Europe appears from several considerations. The European quails lay spotted eggs, to the number of six or seven: they are very much given to fighting; and are remarkable for the hotness of their bodies. While the New-York quail lays white eggs to the amount of fifteen or more; is not pugnacious; nor supplied with heat enough to bring chilly hands to a comfortable temperature. Besides, our quails are justly reckoned very fine birds for the table; but those of Europe, though they might have been the quails which the Israelites fed upon in the wilderness, were not generally eaten by the ancients, notwithstanding they were found almost all over the old continent, migrating in flocks, during the spring, to the north, and in the fall to the south. Their quail, too, is described as being a noisy bird at night; whereas ours utters his note in the day-time, during the breeding season, in a sort of double whistle.

Upon the whole, then, it would seem that the two species of birds under consideration are neither pheasants nor European quails. It is quite a mistake to give the name "pheasant" to the *pinnated grous;* and also an error to confound the American quail either with the quail or partridge of Europe.

I am enabled to write with the less hesitation on this subject, by reason of an occurrence of which I have availed myself by the politeness of Mr. John Aspinwall. This gentleman, on his late return from Europe, brought with him ele-

gant dried specimens of the principal sorts of game-birds which are found in England, both male and female. They arrived in very fine order, and are a rare exhibition to our fowlers and naturalists. Among these are the *black grous*, or Tetrao Tetrix; the *red grous*, or *moorfowl*, Tetrao —— (not mentioned by Linnæus); the *white-game*, or *ptarmigan*, Tetrao Lagopus; the *English partridge*, Tetrao Perdrix; and the *European quail*, Tetrao Coturnix; of both sexes. Now, after examining these specimens carefully, and comparing them with Pennant's accurate descriptions and plates, in his British Zoology on the one part, and with the American species of Tetrao on the other part, I can confidently say that I have never yet met with a single individual of those five species of European birds in any of our fields or markets. Hence it happens, that an United-States-man and an Englishman constantly misunderstand each other when they use the terms *grous*, *partridge*, *quail*, and *pheasant*.

Mr. Aspinwall likewise brought with him a specimen of the *English woodcock* (Scolopax Rusticola), which is clearly a different species from ours of the same name; and of the *English Snipe* (Scolopax Gallinago), which is undoubtedly the same species with the bird known among our sportsmen by the same appellation.

This gentleman has also fine specimens of the male and female pheasant of England, which are wholly unlike any wild birds I ever saw or heard of in the United States. Besides, every ornithologist knows that the pheasant is a Phasianus. Of their family, our barn-door poultry, or cock and hen (Phasianus Gallus), are the leading species. The pheasant of Pennsylvania is a Tetrao, and consequently must be miscalled.

In short, the scientific and common names of the game-birds so fashionable over our fields, on our tables, and in our conversations, may be set down and arranged in this manner, to wit.

I. European game-birds, not natives of America.

1. Black grous, black-game, or heath-cock,	Tetrao Tetrix.
2. Red grous, red-game, moor-cock, or moor-fowl,	Tetrao ——? a species described as peculiar to the British Isles, and not known to Linnæus.
3. White-game, or ptarmigan; erroneously called the white-partridge,	Tetrao Lagopus.

4. English partridge, Tetrao Perdrix.
5. European quail, Tetrao Coturnix.
6. Asiatic or Colchic pheasant, Phasianus Colchicus.
7. English woodcock, Scolopax Rusticola.

It does not appear to me that one of these seven species is found in Fredonia, nor, I believe, in America: for it is questionable whether the bird which is seen in the countries toward Hudson's Bay, and is mentioned as a white-partridge by Mr. Mackenzie in his Travels, is the ptarmigan. It is more likely to be the Tetrao Albus.

II. American game-birds, not found in Europe.

1. New-York partridge, Pennsylvania pheasant, or pinnated grous, } Tetrao Cupido; has feathers half down his legs; is a grous, and ought to be so called.
2. New-York, New-England, and Virginian quail, or Pennsylvania partridge, } Tetrao Virginianus.
3. American woodcock. } Scolopax —— ? certainly a Fredish species, different from the British.
4. Long-Island grous, or ruffed heath-cock, } Tetrao Umbellus.

I have found by inquiry in their native region, that at the breeding season these birds go in pairs—lay their eggs in May, amidst the brush and heath of Suffolk county, to the number of twelve or fifteen, of a brown colour, much resembling those of the Guinea-hen. At that time the cock struts, fights, erects his neck-feathers, and makes a pretty loud tooting noise. They feed on worms, insects, acorns, hurtle-berries, partridge-berries, and in the winter on the buds of the pine-tree. They always roost on the ground, and in severe winters penetrate the snow for that purpose.

III. Game-birds common to both hemispheres.

1. The English snipe, } Scolopax Gallinago; is found in both continents. Pennant writes that "they are most universal birds, found in every quarter of the globe, and in all climates."
2. The golden plover, } Charadrius Pluvialis; is probably the *green-plover*, or *frost-bird* of the Long-Island sportsmen.

Having thus attempted to draw an outline of this small department of natural history, I cannot conclude without expressing the hope that some successful attempts may be shortly made to bring the living birds prized by British sportsmen from their native country to ours. Doubtless they might be readily naturalized, and soon stock our land with a race of inhabitants whom every gentleman would be glad to entertain and patronize.

With affectionate and fraternal regard, I remain, &c.

ARTICLE IV.

Brief DESCRIPTION *of the* COUNTRY *on the* COAST *of* SOUTH-AMERICA, *from Porto-Bello to Carraccas on the East, and from Panama to Guayaquil and Lima on the West. By Mr. ——, who has visited it. Extracted from his Communication to Dr.* MITCHILL, *of Jan.* 27, 1804.

PORTO-BELLO has an excellent harbour, is situated at a narrow part of the Isthmus of Darien, is eighty miles by land from Panama (on the opposite side of the Isthmus), and 180 W. S. W. from Carthagena. There is no communication from thence by land to Carthagena, as the whole western and southern parts of Darien (within the gulph) are in possession of the Indians, who bear a mortal hatred to the Spanish name, and the Spaniards a great fear of them. Ten leagues westward of Porto-Bello is a small town called Chagres, situated at the mouth of a river of the same name, which is navigable for large canoes forty-five miles up, to a place called Cruz; from whence the distance to Panama is but seven leagues. The usual communication from Porto-Bello to Panama is by this river. Westward of Chagres 150 miles, empties the river St. Juan de Nicaragua, which rises and takes its name from a large lake in the province of Leon.—The lake of Nicaragua extends within a few miles of the Pacific Ocean.

From about the time of the autumnal equinox, till February or March, the whole country in the vicinity of the Isthmus of Panama, is deluged by almost incessant rain; during which time the winds are very variable on the Atlantic side, but mostly prevail from the westward. The remaining part of the year the winds are more regular, and prevail from the eastward; the atmosphere is then dryer, and the inhabitants

more healthy. It is very seldom, however, even in the dryest seasons, they are more than a day or two without excessive rains—so that the miserable inhabitants seldom feel the regenerating influence of the sun, his piercing rays being incapable of penetrating through the thick vapours which obscure him from their sight. The country is mountainous, and covered with a thick impenetrable wood. This narrow strip of land, which binds together North and South-America, being situated between two immense oceans, is destined to be perpetually covered with thick vapours, raised by the intense heat of the sun from the two oceans, which being naturally precipitated by the winds to the same point, and impeded in their progress by the mountains and contrary current of air, here concentrate, are condensed, and fall in torrents of rain, like the waters of an immense river down a precipice.

The vast quantity of stagnant water with which the earth is perpetually covered, emitting incessant vapours, which impregnate the air with their noxious qualities, may be the principal cause why it is extremely unhealthy.

The inhabitants of this country are mostly natives, the climate being so inimical to European constitutions, that few of the latter venture a long residence. They are a diminutive, emaciated set of wretches, and have more the appearance of walking phantoms than of human animated beings.

The prevailing diseases in this country are: 1st. The leprosy, which all the inhabitants are more or less afflicted with, and strangers, soon after their arrival, are attacked by it, particularly at Porto-Bello. I imputed the cause of this loathsome disease to the water, which descends from the mountains by a natural aqueduct into the town, and from thence to the sea, and of which the inhabitants drink freely, seldom mixing with it any kind of spirits. It is extremely cool and pleasant, and of a clear bluish cast.

Secondly. A disorder, called by the Spaniards, dolor-acostado, or pain in the side, which, when settling on the right side, affects the liver, and when in the left, forms a hard lump, which attaches itself to the side, and generally terminates in death. This is occasioned (say the Spanish physicians) by a concentration and stagnation of the blood in the part affected. The extreme pain it gives the patient as the disorder increases, occasions a violent fever. For this complaint they give strong purgatives, bleed profusely, and rub the part affected with warm tallow, as likewise the extremities of the body, which

produces violent perspiration—they sometimes make an incision in the side for the matter collected to discharge itself.

Thirdly. Pulmonary complaints are frequent.

Fourthly. Bilious fevers, which are the prevailing disease in that country, and generally come to a crisis the seventh or ninth day. If they do not terminate in death, the patient is left extremely weak and debilitated, and remains a long time in a convalescent state; indeed, seldom recovers perfect health without change of climate. The remedies prescribed for this disorder are strong purgatives, profuse letting of blood, injections, and bark, when the fever subsides. They recommend a thin broth, made by the boiling of a fowl in water, barley-water, &c. for constant drinks; and will not suffer the patient to eat any thing while the fever is upon him, but allow him to drink as much water as he pleases. The part most affected by this disorder is the head.

It possibly may not be uninteresting to mention, that a proposition was made to the Court of Spain, to open a canal from the bay of Panama, to communicate with the river Chagres at Cruz, and so with the Atlantic Ocean. It was rejected on the supposition that it would deprive the Pacific of so much water as to leave their harbours on that side dry; and, on this, have a tendency to overflow the West-India islands, and the sea-coast of the continent, as it was contended that the waters of the Pacific at that part of the continent were much higher than on the opposite side in the Atlantic Ocean. This is probably an absurd idea, and the more probable cause of rejecting the proposition, arose from those contracted principles of policy which distinguish the Spanish cabinet, and which tend to deprive other nations from profiting by an intercourse with her American possessions; which a canal would much facilitate, and expose her possessions in the Pacific to an easy conquest. It is not foreign to the subject to relate, that the ebb and flow of the tides at Panama, is from 14 to 20 feet, and that at Porto-Bello they are but three or four feet.

Should a canal ever be opened at the place mentioned, it will probably cause a complete revolution in commerce, and make Panama and Porto-Bello two great emporiums for the interchange of the productions of the eastern and western world.

There are many considerable settlements on the lake and river of Nicaragua, and between the river and Panama, on the gold mines of Veragua, from which are taken about twenty quintals of gold annually. The provinces of Veragua and

Costa-Rica (between Panama and the lake) are not numerously peopled, neither is that of Leon; but by means of this lake vast quantities of goods from Porto-Bello would find their way into the district of Mexico, and from thence the whole country within the jurisdiction of Guatamala would receive supplies, as likewise from Panama, which is situated at the head of a deep and spacious bay, about two hundred leagues S. E. from the city of Guatamala. Panama is a walled town, and contains about 30,000 inhabitants. In a southern and western direction from thence, about six hundred miles, is the city of Guayaquil, situated upon a river which rises from the Andes in the province of Quito, and unites its waters with those of the Pacific Ocean at Guayaquil Bay. This river is navigable, and goods are conveyed up it thence to the city of Quito. Between Panama and Guayaquil are several intermediate ports, which would receive more or less goods from thence, from whence they would likewise find their way to Quito. Poyta is a very considerable town on the Pacific, about one hundred miles from Guayaquil. The province of Quito is very populous, and said to be the richest of Peru. Lima is about eight hundred miles from Guayaquil, well known as the most opulent and luxurious city of South-America. It is the great emporium from whence every part of Peru receives supplies, as likewise a greater part of Chili, and monopolizes almost the whole trade of South-America on the Pacific side, when Spain is at peace, and has a free intercourse with that country.

Sta. Martha is about ten leagues from Carthagena, and the river St. Magdalena unites with the Atlantic between those two places. The River St. Magdalena rises in the Andes, in the province of Grenada, and those two places are the reception of the productions of that province, and supply it with merchandize. From St. Martha to Carraccas there is a safe communication by land or water, and the expenses attending the transportation of goods by either mode of conveyance are trifling, so that I calculate my plan to include the supply of the principal part of that country also.

The trade of that part of Spanish America which my plan comprises is very limited and confined. The European merchants enjoy all the advantages to be derived from their external commerce, the unjust and impolitic laws of their country having given them the power to impose their own prices on the American subject for the manufactures of Europe, and to receive the produce of their country on such terms as they think proper. Their internal commerce is principally an illicit

traffic, which every class of people, from the viceroys to the meanest subjects, are more or less concerned in, and is reduced to such system by habit and custom, that each has his price for his perfidy in proportion to the value of the trade he facilitates.

There are manufactured in Peru some coarse woollen cloths and linen, as likewise hats, leather, &c. the only manufactures they are allowed to enjoy, though possessing a country capable of producing, with little labour, every raw material the manufacture requires.

During the late war the inhabitants of South-America received their goods by a trade with the West-India Islands, by the English and American whaling vessels on the coasts of Peru and Chili, by a commerce from this country to the River of Plate, and round Cape-Horn to Chili and Peru, which, with the exception of some few special permissions, granted generally to the Spaniards, and the property covered by our citizens, was a clandestine trade against the laws of Spain.

From the English islands they received their principal supplies, being allowed a trade thence by act of parliament, under certain restrictions, and protected from British capture by licenses from the different governments.

From Jamaica nearly the whole country from the Gulph of Mexico to Carraccas received almost wholly their goods, a great proportion of which went to Porto-Bello, on account of its vicinity to the Pacific Ocean, to Nicaragua, Carthagena, and St. Martha. From an intimate acquaintance with the trade from Jamaica the two years previous to the close of the late war, I am certain that at least two millions in goods were shipped from thence yearly. Porto-Bello once commanded an immense trade. Before the navigation round Cape-Horn was thought safe or practicable, the richly laden galleons of Spain, after having touched at Carthagena, and disposed of such parts of their cargoes as that market demanded, at a certain season of the year when it was supposed least unhealthy, proceeded to Porto-Bello with the remainder of their cargoes, when a fair was held of forty days continuance for the disposal of their effects. An English ship, by a contract with the Spanish government, was allowed an annual trade to Porto-Bello about the year 1720; was laden in England with a very rich cargo, touched at Jamaica, put her provisions, water, &c. on board of tenders which accompanied her from thence, and proceeded to the fair at the time of the galleons. This privi-

lege was given by the British government to the South-Sea Company.

The Spanish merchants from every part of America met at the time of the fair at Porto-Bello, with their gold and silver, and other rich productions of the country, to exchange them for the manufactures of Europe; and business was there transacted, in the space of a few days, to the amount of millions. Independent of the immense cargoes of the galleons and the British annual ship, great quantities of goods were smuggled into Porto-Bello at that time by the company's ships allowed to trade thither with negroes under the Assiento contract.

From the important discoveries made in navigation about this time, and the spirit of enterprize and commercial enthusiasm which pervaded Europe, hazardous and bold enterprises were undertaken as the thirst for gold increased, and voyages round Cape-Horn were effected and became frequent. From this time the trade of Porto-Bello decreased, and is now very inconsiderable, except by an illicit traffic.

Spanish America was formerly supplied with the manufactures and productions of China and the East-Indies by a trading company at the Philippine Islands. An annual galleon was sent from thence to Acapulco, Panama, and Lima. But the productions of those countries being afforded in Europe and the United States, of late years, much cheaper than they can ship them from the Philippines, the trade from thence is almost entirely done away, and there is only a trifling commerce from Manilla to Acapulco.

A free opening for Fredish commerce to Porto-Bello would supply the inhabitants from the River Nicaragua to the Carraccas on the Atlantic, from Guatamala to Chili on the Pacific Ocean, and the interior country within those limits, at a much cheaper rate than they could be supplied from any other quarter, except possibly that the British from Trinidad would be able to supply them cheaper in the vicinity of Carraccas. But few of their goods would enter the interior, however; as the risque of seizure, and expenses attending the smuggling trade, would deter the Spaniards from any considerable intercourse with that island, when they could be supplied from one of their own ports in the neighbourhood at much lower rates, and incur no hazard by transportation from one place to another.

The spontaneous productions of South-America, and of which, upon this plan, we should receive the greatest part for our merchandize sent thither, are gold, silver, platina (which

is taken from the gold-mines of Chaco only), pearls, precious stones, copper, drugs of various kinds, lignum-vitæ, ebony, mahogany, fustic, braziletto, Nicaragua wood, logwood, and generally every kind of dye-woods, which are in great abundance on the coasts of Porto-Bello, but have never been made an article of export from thence, as they have never had a trade to encourage the procuring of them.

The only place where pearls are taken in any quantity is at the Isles del Rey, in the Bay of Panama. The annual value of the fishery is about $150,000; and the pearls are said to be the best known. But the luxury in dress of the Spanish ladies so enhances the price of them there for ornaments to their persons, that they would not become an article of value for export.

The agricultural productions of that country are cotton, cacao, and indigo. Hides and tallow would become considerable articles of export from thence, and so would tortoise-shell.

The country in the vicinity of Porto-Bello, though extremely fertile, remains in the same uncultivated state in which nature formed it; hardly presenting a single trace of the art or industry of man. In the neighbourhood of Panama the attention of the agriculturist is paid only to the breeding of cattle.

In the provinces of Leon and Costa-Rica considerable quantities of indigo and cacao are produced; but of the latter article we should receive the greater part from Guayaquil, where it is produced in abundance. We should receive from Guatamala, by the way of Panama, the greatest quantity of indigo, and perhaps some cochineal; but there is no attention paid to the culture or gathering of that article in the southern part of America.

The province of Carthagena produces great quantities of cotton, and thence eastward there are considerable quantities raised.

In the vicinity of Santa-Fè, in Grenada, wheat and other kinds of grain are raised in abundance. But the expense of conveyance so enhances the prices, that by the time they arrive at Carthagena, Porto-Bello, or Panama (whether from thence or from Chili, where they are also produced), that we could supply those places with flour much cheaper than they can now obtain it.

ARTICLE V.

A CASE *of* LUNACY, *with a new Argument in favour of the* VITALITY *of the* BLOOD. *Addressed to the Editors by* THOMAS EWELL, *Student of Medicine in Virginia.*

ENGAGED in the study of medicine, and desirous of extending my knowledge in anatomy, I lately undertook the dissection of a man who died in Dumfries (Virginia) last May. The occurrence of several unexpected phenomena induced me to prepare and offer for your consideration an account of the case.

It was with difficulty I could collect any information relative to the former affections of the subject. The little I did, served as an incitement to make further inquiries. This rendered my regret the greater, when I found the following only could be obtained.

The man was named Benson, about 35 years old. For several months previous to his death he had lost his ordinary understanding. At first the symptoms of idiocy were only occasionally betrayed. These gradually became more remarkable, and of longer duration, till he had no intervals of sound sense. Still, however, at particular periods, there was considerable difference in his state; the disease being increased by various exciting causes. His appetite was extremely depraved, and his habits equally irregular. Being very capricious, he would take at one time but little nourishment; at another he would eat it in large quantities with voraciousness. Notwithstanding the perversion of his mind, he was pleased with ardent spirits. In this state unusually small quantities would render him intoxicated. Without a home, he was obliged often to encounter the inclemencies of the weather; and from its sudden vicissitudes he was rarely sheltered. The charitable hand occasionally extended its aid to relieve him; but it was inadequate to the providing him accommodations in a house with persons to take care of him. From the irregular periods at which he took and could obtain food, his disease was increased; an exacerbation of all his symptoms was the concomitant of a full stomach. The indirect operation of alcohol was also attended with the same effect. When he had taken much food, or used ardent spirits in excess, he rarely missed a fit before their effects were off. During these there was a loss

of voluntary motion: convulsions supervened, which terminated in the restoration of volition in the course of an hour. After the fit, an old woman who saw him told me he seemed much weaker than usual. The violence of these paroxysms increased with their frequency; till at length, after a remarkable transition in the weather from heat to cold, he was seized with one near the town, and died in the night on the public road. On the ensuing morning, in conjunction with Mr. William M. Weems, student of medicine, the dissection was commenced. According to the usual mode, the abdomen was opened. We were forcibly struck with the morbid appearances which presented themselves. The enormous bulk of the stomach, and the uncommon distension of the intestines by flatus, were alike remarkable. In order to procure a full view of the parts, the sternum, with the connecting cartilages, was removed. This being done, we found the lungs had undergone formerly considerable inflammation. They adhered on all sides to the thorax and diaphragm. Their adhesions were stronger than any I had ever seen. The new membrane connecting the inferior lobes to the diaphragm was sensibly the thickest and most unyielding.

The pericardium contained about two ounces and a half of serum. Considerable adipose matter had accumulated about the heart. Large polypous concretions were found in the left ventricle.

The stomach was, as near as I could ascertain, twice the common size. The appearance of the exterior coat was not natural: it seemed to have been considerably inflamed. A small aperture, giving vent to the flatus, reduced its magnitude as well as that of the adjacent parts. Still, however, its bulk was equal to that of most stomachs. On pressure, a hard, moveable substance was felt in the cavity. An incision being continued across the stomach, we found it considerably thicker than common. The muscular coat appeared twice the usual thickness: its fibres were distinctly seen and remarkably red. The internal or villous coat, as might be expected, was but little corrugated. In some parts it had a dark blueish hue, which appeared to have been the consequence of inflammation. Excepting a small quantity of mucus and gastric juice, nothing but this hard mass was in the stomach, which accidentally was broken before it was extracted. When the parts were held in contact it had a curve, and was not unlike an injected stomach. Its size was about equal to a common pine-apple. Indentations could be easily made on it with the thumb; and,

when cut with a knife, a little grit was sometimes felt. Its weight was about eighteen ounces. The duodenum, about three inches below the pylorus, was contracted to half the size. The stricture was not more than half an inch in length. A similar one was in the rectum, four inches above the anus. The epiploon or omentum was bundled up in the left hypochondrium. We saw nothing more diseased among the viscera, except the spleen. This was not half the usual size. We attributed its diminution to the pressure of the distended stomach. Does not this favour the opinion that the office of the spleen is to contain blood, which is pressed out by the distended stomach when we eat, for the purpose of increasing the secretion of the gastric juice?

I could not ascertain whether the contents of the cranium were in a morbid state or not.

The above appearances sufficiently show the very diseased condition of his primæ viæ. I was at a loss how to account for the formation of this curious substance in the stomach. It had not sufficient grit in it to justify my ranking it among the calculous concretions found in the stomachs of some dissected by Morgagni, or those reported in the Sepulchretum of Bonetus. But the preceding inflammation of the adjoining parts (the pleura of the lungs) enabled me to form some idea of its formation. The increased action of any part is attended with increased heat; more especially in the lungs, where the morbid action in the blood-vessels must accelerate the oxydation of the blood, the generation and elimination of heat must be considerable. From the proximity of the stomach this stimulus must have been imparted to it, and increased the action of the excretions opening into its cavity. The stricture in the duodenum preventing the passage of this mucus, must have been the primary cause of the disease. The more fluid parts escaping, must have increased the density of the remainder, which may have united with grit occasionally taken in. It not being soluble in the gastric juice, it could not be affected by it. The ball stimulating by distension the stomach, must have increased the action of the excretories. The secretions uniting with the ball increasing its bulk, must have rendered it still more stimulating; so that the effect increased the cause. The spasmodic contractions of the stomach, which it must have excited, account for the uncommon thickness of the muscular coat. The remarkable connection between the brain and stomach has been too often observed to need notice here. It is equally well known that many of the acute pains of the head

proceed from sympathy with this viscus. Hence the great relief obtained from medicines which restore it to its healthy state. It does not appear unlikely that many chronic affections of the head may originate from the same source; nor is it less likely, that medicines, acting powerfully on it, might mitigate some of the sufferings of those labouring under mental derangement. The present case affords a strong presumptive argument. The exacerbation of the symptoms from large quantities of food, the increased susceptibility of the stomach to be acted on by alcohol, together with the appearance after death, corroborates the idea. The respectable Dr. Saunders, from experience, recommended the exhibition of a remedy in "sick head-ache," which acted solely on the stomach. This was his favourite diluent, "pure and tepid water." Its utility he also notices in biliary and dyspeptic complaints. Since so judicious a physician has prescribed so simple a remedy, may we not venture on it in other diseases alike arising from sympathy with the stomach? Exciting a convulsive action in the stomach, accompanied with a free use of warm water, would probably have relieved Benson. The same practice may have its advantages in other cases. I am conscious that a great authority is opposed to the exhibition of emetics, attended with a supposed turgescence of the blood-vessels of the brain; but observation is a better guide than authority. I have more than once seen marks of returning reason in maniacs and drunkards, during the nausea preceding the operation of emetics. Whether they remove spasm, rouse the *vis med. naturæ* into action, equalize excitement, or accelerate the solution and expulsion of extraneous substances from the stomach, they seem equally proper. The free use of a diluent may be of incalculable service, simple as may be supposed the practice.

After determining to forward the above, I thought it would not be unacceptable to subjoin a new argument in favour of the vitality of the blood, which I lately became acquainted with. If the vital principle of seed prevents the action of gastric juice on them in the stomachs of certain animals, I concluded that the same power should show similar effects, if it actually existed, when the coagulated blood was under similar circumstances. In order to ascertain the correctness of my conclusion, I resolved to submit it to the test of experiment. For this purpose, blood taken from a hog was permitted to co-

agulate in a temperature of about 80 degrees of Fahrenheit. Soon after the coagulation, three portions, each weighing three drachms, were separated from the mass. The first was submitted to a degree of heat something less than that of boiling water for five minutes. The second was put in a tin vessel, surrounded by a parcel of ice, where it remained three hours. The third was not touched until the whole were taken and immersed in a vessel containing a pint of gastric juice, which had been taken from a dog and a hog. The vessel containing them was then placed in an oven, the heat of which varied from 94 to 100 degrees. Thread being attached to each portion, they were withdrawn in three hours. The first only was a little dissolved. The vessel was then occasionally shaken, and in three hours more the first portion was nearly entirely dissolved; the second had lost half its bulk. They were not examined till the ensuing morning (eight hours more having elapsed), when the two first were entirely dissolved. The heat of the oven had fallen to 80 deg. No alteration could be seen in the third portion, except its being a little *contracted*. When I divided it, I found it was considerably more compact than at first. I attributed this to its having parted with its serum. When exposed to some oxygen gas, the inner part acquired a vermillion colour. How to account for the preservation of the third portion, without calling in the agency of the vital principle, is beyond the power of your respectful servant,

T. EWELL.

ARTICLE VI.

An ACCOUNT *of the* WEATHER *and* DISEASES *at Wilmington (Del.) during the Year* 1803: *In a Communication by* JOHN VAUGHAN, *M. D. to Dr.* MITCHILL, *dated March* 6, 1804.

AGREEABLY to promise, I address you with an historical sketch of the diseases of Wilmington for the year 1803, with the accompanying states of weather.

January was healthy, and moderately cool until the middle of the month. One snow of six inches in depth. The latter part was intensely cold, with occasional rains and high winds.

February came in mild, but on the 3d we had a tremendous hurricane, with rain, hail, and snow, succeeded by an excessively severe frost. From being muddy, and even miry, the ground in two hours bore loaded waggons.

March was comparatively pleasant.—The winter of 1802-3 was healthy. When the pestilential fever which afflicted us was arrested by the frosts of October, there was a suspension of every thing like epidemical disposition to disease until March. In the latter month influenza appeared in a moderate degree, most severe in elderly persons, in infants and valetudinarians.

April, heretofore proverbial for its pleasant and refreshing showers, was unusually dry, blustering, and disagreeable. On the 16th and 17th we had a brisk storm, with torrents of rain and lightning; and early in the morning of the 20th electrical meteors were surprisingly numerous and vivid. Newspaper accounts since inform us that the same phenomena were observed over a great part of the country.

The influenza continued in April. Convulsions were frequent in the febrile disorders of children. A few cases of scarlatina occurred in the last of the month. On the 26th and 27th there was a second storm, with rain, from the north-east.

May came in pleasantly warm, but soon became cool, with frequent rains and lightning. On the night of the 7th there was a violent storm of rain, with lightning, and on the morning of the 8th the roofs of the houses were covered with snow and ice, presenting a very unusual and unpleasant spectacle, and exciting considerable apprehension for our spring and summer fruits. After this storm we had dry weather until the 24th and 25th; then a cold rain, with north-east wind: 30th a heavy rain; and, with the exception of two evenings, the wind was north-east all the month.

The diseases of May were rather of a mixed character. We had a few cases of influenza, some cases of scarlatina anginosa, and a variety of slight and equivocal disorders.

June was, in the beginning, pleasantly warm and clear: winds southerly, with frequent lightning and rain. From the 8th to the 15th the weather was dry and hot; on the latter disagreeably cool, but soon became hot and dry again: temperature from 80 to 86 degrees; and the ground excessively dried and dusty.

Diarrhœa, and alternate vesicular eruptions, were the only diseases which merit notice in this month.

July was warm and dry until the 14th, when a light shower refreshed us, and merely allayed the dust: temperature varying between 76 and 89 deg. There were frequent apparent, but delusive, indications of rain, and daily electrical phenomena. On the 24th, at 2 P. M. a refreshing rain, with a brisk breeze from the southward, saluted us: 26th and 27th heavy showers. Those rains were highly acceptable and invigorating. Perhaps rain has not been more welcome since the year 1793. The frosts of spring, with the drought of June and July, had destroyed nearly all our summer fruits. The grass itself was so much parched that cattle could merely subsist without fodder.

In the first half of July we had a number of cases of chicken-pox (varicella)—cutaneous eruptions, or vicarious diarrhœa—colic, or cholera, in adults. In the latter part of the month there were a few, and but few, cases of cholera infantum. The intestinal form of disease was principally confined to adults. Diarrhœa and dysentery were general.

August was temperate and showery until the 10th. On the 13th there was a storm of thunder and rain, and on the 16th a copious rain also. The latter part of the month was dry and warm.

The diseases of August were a continuation of the forms of July. Dysentery was general and more formidable, but gave place to typhus fever after the heavy rains on the 16th and 18th. Children were nearly exempt, as in July, from cholera infantum.

September was, after the 5th, cool, with frequent rains; and typhus fever became general and stationary during autumn. Hoar-frosts were frequent in September, and on the 18th of October there was ice.

November and *December* may be termed healthy. A very few cases of typho-catarrhal fever occurred.

To this sketch of the diseases, with the accompanying states of weather, may be added a few general observations on the nature and force of dysentery and typhus fever. The diseases of spring were in no wise remarkable. June is usually free from epidemical disposition, but the occurrence of intestinal disorders indicated a new series of disease this season.

Wilmington, and the country south, on the Peninsula, are seldom affected with dysentery. Our elder inhabitants say it is thirty years since dysentery prevailed epidemically here until 1803; and as this disease is the proverbial attendant of hot and dry seasons, is it not reasonable to term it the indigenous offspring of heat and drought? One circumstance, probably,

having influence in the propagation of intestinal disorder, was the partial and imperfect state of our summer fruits. The partial quantity of fruits rendered them objects of luxury, and occasioned such to be eaten as would, in former seasons, have been rejected.

Although the epidemic prevalence of dysentery is unusual with us, there was nothing otherwise remarkable in the character of the disease. The febrile action was moderate, and easily controuled. I knew of no case requiring blood-letting, and heard of but one case proving fatal in town. Alkaline remedies were generally relied on—calomel little used. Our neighbours in the adjacent country were less fortunate, and a variety of circumstances combine in rendering this disease more fatal to country people than to citizens. The unconquerable horrors of contagion, with a general ignorance of nursing, not only interrupt the indications of the physician, but obstinately conspire against the life of the patient. To say that dysentery is not a contagious disease, might subject me to the criticism of some of the faculty; but I firmly believe that our disease was indigenous and non-contagious. Dysentery superseded cholera infantum, and, in its turn, also gave place to autumnal fever on an incidental change of weather. The transformation of dysentery into typhus fever, immediately after the rains in the middle of August, was as strongly marked as any case of the kind could be. An epidemical disposition to intestinal disease commenced with the drought in June, continued with it throughout July and until the middle of August, and immediately changed its shape with the change of weather, previously particularized.

Typhus fever, like all other febrile tyrants, banished every subordinate relative. The pestilential fever of 1802 possessed not a more despotic dominion than the typhus fever of 1803.

Three grades of disease were distinctly observable.

1. The *Walking State of Fever*. This insidious form of disease was attended with a dull pain of the head, mostly in the forehead; a small and frequent pulse, lassitude, furred tongue, and costiveness; and if neglected eight or ten days, terminated in a confinement of four or six weeks. But every case might, within a week of the first sense of weariness, be arrested, by a blister to the nape of the neck, to concentrate the undefined action in local disease, the free use of seneka, (polygala senega of Linnæus) and Peruvian bark, to give tone to the system generally.

2. The ordinary, or more *common grade of disease*, com-

menced with a sensation of chilliness—pains of the head and limbs, and especially of the back; a general sense of weariness or prostration of strength; duiness of the eyes, pulse soft, small and frequent, and costiveness. The tongue soon became coated with a clammy furr or fuzziness, resembling white velvet besmeared with soap-ley. If these symptoms were not arrested within ten days, a new and more formidable train succeeded, consituting the

3d. Or, *Malignant State of Disease.* The malignant state of disease was, generally, a degenerated condition of the walking or ordinary states of fever. If a moderate evacuation of the bowels, the free use of alkaline salts with seneka, the judicious application of blisters, and the exhibition of Peruvian bark, did not arrest the disease within two weeks, on the third week the eyes assumed a glassy appearance; the tongue became dry and furred, the edges brown, and the end husky and parched; the stomach irritable; or diarrhœa supervened, with nasal hemorrhage, subsultus tendinum, and strangury; a small, irregular, and often shattered pulse, with typho-mania, and black or coffee-ground discharges from the bowels closed the tragedy, on or about the twentieth day: or, a gradual abatement of these symptoms, with returning softness of the tongue, and a free, though weak pulse, indicated a favourable issue. A considerable affection of the brain was always dangerous, if not speedily relieved by blisters.

The malignant state of disease, however, was not always a degenerated condition of the walking or ordinary states of fever. In one case, to which I was called on the second day of the disease, I found the patient in an apoplectic stupor, with a labouring pulse, and convulsive agitations of the limbs. This case surprised me; but as the first indication appeared to be, to free the vital viscera from engorgement, by diffusing concentrated excitement, I immediately drew six ounces of blood, when his pulse faltered, then became free and frequent; sweat appeared on the surface, and the agitation of the limbs ceased; but he could not be aroused from his stupor. His bowels being costive, stimulating injections were given every half hour until they operated freely; and as the heat and action on the surface remained defective, four blisters were applied to the arms and legs, and in six hours he awoke as if from a sound sleep. In fact, I have no doubt but his stupor would have ended in the sleep of death, if he had not obtained speedy relief. Such was my expectation, and such my prognosis to

his friends. He finally recovered, after a varied and lingering course of fever.

In one case of degenerated disease, from the walking through the ordinary form, to the malignant state of fevers, the patient had daily oozings of blood from the nose, gums, lips, and bowels; his blisters gangrened, and formed a complete case of putrid typhus fever, so called. By the external and internal use of bark, volatile alkali, Madeira wine, &c. he recovered.

The general treatment of this fever varied but little from the commonly prescribed method of writers. Alkalies were freely used; and though they may be termed a generic remedy, they were not designed to attenuate lentor, concoct the fluids, nor appease the non-naturals, but to prepare the intestinal canal for the operation of vegetable tonics.

It was necessary to observe, with scrupulous attention, the occurrence of *the blistering point*, which was generally designated by the tongue, evincing a disposition to dryness of the end, or a brownish stripe along the edges; the pulse becoming small, faltering, or irregular; an evident disposition to increased local action; subsultus tendinum, or sense of coldness in the feet; and it was, in most cases, necessary to perpetuate action on the surface, by the application of blisters, until the tongue became soft, without clamminess, or a complete remission of fever, with a moisture of the skin, was obtained. The ordinary course of febrile action, was a partial remission in the morning, increasing through the day, and a more violent exacerbation in the night.

A few cases commenced with rheumatic pains of the limbs and tooth-ache, and the return of these symptoms indicated, with certainty, the forming state of convalescence.

In the commencement of fever in August, a few cases of the synochus grade occurred, requiring one blood-letting.

As it is desirable to ascertain, whether the autumnal fevers which afflict us are indigenous, or of foreign origin, and as all the different grades of typhus fever, whether under the character of the ship, the jail, or hospital fever, are considered contagious, and propagated by a specific matter of a mysterious birth and unknown nature, I was extremely anxious to watch the rise and progress, and ascertain, if possible, the real nature of this disease.

The occurrence of fever at different places at the same time, renders the idea of propagation by contagion more than improbable. In fact, there were but few persons among us

who indulged the apprehension of contagion in typhus fever, though the reverse was the case respecting dysentery. The indigenous origin and sameness of disease are clearly deducible from the following facts.

1. The usual forms and course of our summer disease are the cutaneous, intestinal (cholera infantum), and intermittent and remittent fevers in autumn. In 1803 we had vesicular eruptions, or diarrhœa, alternately; epidemic dysentery; and after the rains in the middle of August, the latter was transformed to typhus fever.

2. Dysentery superseded the cholera infantum, and typhus fever completely precluded the bilious remittent fever, which is our ordinary autumnal disease.

3. Dysentery and typhus fever are alike unusual in this district, and hence reciprocally dependent on the extraordinary states of season. Intestinal disease commenced with the drought in June, and continued until the change of temperature in August.

4. The epidemical state of season giving birth to dysentery and typhus fever, was checked by frost, but the forms of disease only were varied by intermediate changes in the sensible qualities of the atmosphere.

5. Typhus fever, like the common autumnal remittent of the tertian diathesis, conveyed its livery to the catarrhal affections which succeeded in November and December.

6. The pestilential fever of 1802 partook unusually of the typhus type, and was probably dependent on a state of atmosphere not dissimilar to that of 1803. The fever of 1802 was uniformly aggravated in frequency and force by every considerable change from heat and dryness to coolness and moisture of the weather: so was the fever of 1803.

P. S. An improvement, promising a favourable influence on the future health of our borough, is the supply of pure and wholesome water from a fountain. Most of the wells in the lower parts of the town are on a level with the tide, are also surrounded by vaults, privies, and all the common repositories of ordure, and the water rendered unfit for culinary purposes.

In the spring of 1803 a company was formed, under the title of "The Wilmington Spring-water Company," with a subscription stock of $3000. On exploring the south side of the hill in High-street, near the Friends' meeting-house, they discovered a fountain suited to their purpose; and by

sinking a well, and extending a French drain obliquely north and west along the sides of the hill, they collected a stream of twenty gallons a minute. From the fountain pine aqueducts are laid to Shipley-street, and empty into a reservoir of brick masonry, calculated to hold 30,000 gallons, and furnished with forcible pumps to discharge the water in case of fire.

It is expected that the addition of one thousand dollars to the stock will distribute the water through all the streets south of Third-street. The company have obtained a charter from the legislature, and mean to resume their useful labours as soon as the season will permit.

J. V.

ARTICLE VII.

An ACCOUNT *of* PATIENTS *ill of* MALIGNANT FEVER, *received at Bellevue Hospital, near New-York, in the Summer and Autumn of* 1803.

[*Dr. Hamersley requests the favour of Dr. Miller to insert the accompanying document in the next Number of the Medical Repository. It was drawn up, at his request, by Dr. Isaac Forster, who was the Resident Physician at Bellevue Hospital.*]

THIS account is designed to exhibit a statement of all the patients received at Bellevue Hospital from the 12th August, the period at which this house was opened for their reception, to the 29th October, 1803; with a detailed account of their ages, occupation, places of nativity, period of admission, their previous residence, the day or stage of the disease, the event, together with some general observations. The whole number admitted during this period were 186. Of these there were twenty negroes and one mulatto. The cases of recovery correspond in number to the deaths. It is to be remarked that several persons were received in the last stage of the disease, and some were actually dying or dead at the moment of their reception. There were no instances of axillary or inguinal bubo, and only one where any kind of glandular swelling could be said to have occurred. This was a disease of the maxillary glands, arising from the excessive use of mercury. The patient was admitted on the twelfth day of the

disease, and had taken large quantities of mercury, as was evinced from the state of the mouth and fauces. The swelling of the maxillary glands succeeded. It terminated in suppuration, and the patient recovered. There were no instances whatever of carbuncles, or eruptions of any kind, that corresponded, in the least degree, to any description given of them by writers on the plague.

New-York, April 2, 1804.

[This valuable document, as it came into the hands of the Editors, exhibits a tabular view of the names, ages, occupations, places of nativity, dates of admission, parts of the city whence taken, stage of disease, termination in death or recovery, time of stay in the hospital, and a variety of other observations concerning the individual cases of 186 patients. This long series of names would obviously have had too much prolixity for the nature of this work. The Editors are therefore compelled to abridge the paper, by exhibiting the following brief and general view of its principal contents.

Of the patients admitted at Bellevue, 100 were males, 86 females. With a few accidental exceptions, they consisted of persons belonging to the most indigent class of society, labourers, hired servants, &c. Many of them had been long addicted to intemperance in drinking, and, among the females, a considerable number had been given up to the habits of prostitution. Of the number received only a small proportion were natives or residents of New-York. The principal part were emigrants from Ireland, Great-Britain, Germany, and other countries of Europe, most of whom had recently arrived in this country. A large number consisted of strangers from different parts of the United States, who were either casually here, or had very lately obtained a settlement.

The different parts of the city from which these patients were brought seem to indicate that the disease was greatly diffused. Fifty-seven streets are noticed in that part of the catalogue which indicates the place where the patient was found. Among these East George's-street produced the highest number; next in order, Charlotte, Front, Water, Lombard, Stone, Greenwich, Wall and Birmingham streets.]

REVIEW.

ART. I. *The American Distiller; or the Theory and Practice of Distilling, according to the latest Discoveries and Improvements, including the most improved Methods of constructing Stills and of Rectification. By* Michael Krafft, *of Bristol, Pennsylvania, Distiller.* 8vo. pp. 219. *Philadelphia.* Dobson. 1804.

TURNING to our Hex. I. vol. vi. p. 208, we find mention made of two improvements in distillation, by citizens of Pennsylvania. One of the persons there named has now come forward with a book on this extensive and important art, and offered to the public the result of his own inquiries and experience therein. And to render verbal description more clear and intelligible, he has added prints and delineations of stills, furnaces, and various other parts of the machinery of such a manufactory.

Although nearly one-fourth of the national revenue is derived from the duties on distilled spirits imported from foreign parts, yet the quantity of these strong waters prepared within our own territory is very great. An idea of the rate at which they are consumed was given in the same volume, p. 383. And as, at present, no excise is collected from distilleries, there is great encouragement held out to the extraction of spirits from domestic materials, both for the purpose of home-consumption and exportation.

In the passages of our work just quoted, and in the copious account we gave, in the same sixth volume, p. 188, of the Jamaica proceedings in improving sugar and rum, we offered several moral and political reflections on these artificial preparations and their effects in society. For this reason we shall be the more sparing of similar remarks at present. Whatever may be the pernicious consequences of excessive drinking of spirituous liquors, and of habitual intoxication, there is some satisfaction in tracing the cause wherefore mankind are so universally fond of some beverage which changes the ordinary state of their feelings, and hurries them, as it were, out of themselves. Even among the ruder tribes of men, to whom fermentation and distillation are unknown, the mad-

dening or narcotic qualities of certain vegetables are employed occasionally to vary the monotony of existence, and to enliven the torpid animal by their peculiar stimulation.

Man, in this terrestrial abode, is doomed to labour, and is often afflicted with wearisomeness and pain. To beguile his toil, to prevent the tediousness of life, and to lull the torments which plague him, he requires the operation of something to excite, entertain and divert. Sports, recreations, games and spectacles of various kinds, have been contrived and indulged to answer these several purposes. The novelty of the objects by which children and young persons are surrounded, and their natural playfulness, afford them, during that period of life, abundant gratification. The acquirement of a trade, the discipline of a regular education, the study of a profession, and the engagement in the active business of life, commonly afford a large portion of stimulus for several years more. When these things pall upon the senses and grow familiar, concerts, theatrical exhibitions, military parades, holiday processions, society-meetings, trips and tours to watering-places, games of skill and chance, horse-racing, shooting, hunting, and other field exercises, parties, fashions, and the like, all contribute their share of excitement to such persons as seek the benefit of their influence. To others, researches in literature and science, the duties of devotion, and the practice of benevolence, supply a more elevated and exquisite enjoyment.

But the scenes of childhood cannot be renewed; and to the greater part of mortals, the time, the money, the taste, and, in one word, the means are wanting to regale themselves in any other way than by the action of some liquid upon the stomach. By virtue of the extensive association of this organ with almost every part of the body, it is found to be the most sure and easy to be applied to for producing the desired effect. And although betel and tobacco, when chewed, work their effects through the medium of the mouth, yet it is perfectly well known, that the stomach sympathizes much more nicely with the constitution.

Of all the substances which nature has formed, or art has contrived, there is none which answers the purposes of gay and oblivious stimulation so well as alkoholic or distilled spirit. In despotic States it is one of the severe displays of power to load this comforting drink with such heavy taxes as to prevent the plentiful use of it by the people at large. Where absolute dominion is exercised, as over negro slaves, the smarting of the lash is substituted for the pleasure of grog. It is only in

free governments, and where taxes are light, that the use of ardent spirits can be freely indulged. Among the citizens living under such happy political constitutions, may be most perfectly seen what good arises from their use as cordial drops, and what mischief from their abuse as noxious drugs. In searching for pastime, it should be at once cheap and ready; and he who can fill and replenish his bottle with enlivening potation, at the cost of a few cents, has a large share of this amusement in his power.

Hence, in our own country, distilled spirits are employed, in winter, to lessen the sensation of extreme cold—in summer, to render more tolerable the intensity of heat—in wet weather, to guard against the unwholesomeness of rains and fogs—and in droughts, to moisten the living clay. When a person is alone, they serve to abate the dulness of solitude; when in company, they give a zest to social glee. In short, they may be considered as the substitutes for public shows and diversions, such as the fights of gladiators and of bulls, &c. and as the *lenimen dolorum* of those persons who perform under their influence the hardest labour and the meanest drudgery, contented with their lot.

But we have, perhaps, said quite enough in elucidation of the principle upon which men take distilled spirits into their stomachs. All we intend is to show wherefore the custom has become so familiar and extensive; observing, at the same time, that an explanation of the cause of such an universal habit is by no means a recommendation of it. Considering, therefore, that the consumption of these inebriating products of the still is likely to increase, the process by which they are prepared is, in our opinion, worthy of particular consideration. And so, without further preface or delay, we proceed to examine the work whose title stands at the head of the present article.

Mr. Krafft appears to be a practical man. His observations, though made in the plain style, strike us as generally judicious and reasonable. His directions concerning the situation for a distillery are founded on ideas of convenience and economy. The instructions for adapting such a manufactory to the extraction of spirit from grain, and for raising water without much expense, impress us as coming from a man of business. But more especially we were struck with his chapter on the construction and shape of stills. This description of the improvement in them, made by himself, and his observations on another improvement, made by Mr. Anderson (p. 29—42), are so memorable as to be worthy of being extracted in his own words.

"From the remotest ages of antiquity down to the present period, the construction or form of stills has suffered an uniform, regular, but slow progression toward improvement. Had we lived two centuries ago, it would probably have been deemed rash to have hazarded an opinion that our successors, at a future period, would have made improvements equal to what we have now to boast of. But we may now venture to assert, with a confidence bordering on a degree of certainty, that no future period can boast that we have left them the smallest shadow of improvement: since, from the first traces of distillation we can find, it commenced by distilling odoriferous plants in open vessels covered with cloths, which were occasionally wrung out, &c. In the common alembic or still, which worked thrice in twenty-four hours with hard labour, down to the present possibility of working stills from twenty to sixty times in twenty-four hours. Nay, we can force the point to almost any degree of rapidity.

"There is, perhaps, no part of the apparatus of the distillery on which more attention should be bestowed by the distiller, than that of the construction of his stills. It forms in itself the sole dictator of the establishment.

"Yet this important point, of all others, is most shamefully neglected. In the United States, the coppersmith becomes the sole agent and artist: he is the distiller's alma mater; in short, he regulates the whole destiny of the manufacturer. This arises from the arbitrary practice adopted by him, of vending his manufactures by the capacity. The farmer or distiller applies to the coppersmith for a set of stills; his price is so much per gallon of capacity; this is agreed on: what is the consequence? The coppersmith searches for the lightest copper he can procure; he makes use of the smallest bottoms he can with any degree of appearance put off; he contracts the breast with a short break off, and, consequently, makes a narrow collar; he then swells out the sides, and as the sides of the still are the cheapest part (being the lightest copper), it will naturally be expected he will make his still as deep as he can (which increases the capacity). Again, the capital, or head, by custom, he makes no charge of. This he contracts as small as it will bear; and in order to make the still appear as cheap as his brethren can do it, he puts it off with as small a worm as the distiller is willing to take: where lead is now absolutely necessary he neglects it; whereas, when the still is bought by weight, he is sure to load it unnecessarily heavy and useless.

"These are the misfortunes which an injured manufacturer is, by horrid custom, obliged to bear—and what is the consequence? He establishes large and expensive works, in the pleasing expectation of doing much business to advantage; but in this he is by fatal credulity disappointed. He finds his stills to work off, by rigid attention, three or four times in twenty-four hours: he is by custom obliged to pay high wages to numerous workmen: he consumes large quantities of fuel: time and labour are wasted: and, after all, he is surprised his business does not succeed to his expectation; and, finally, he is ruined. I know a distillery which works 700 gallons capacity, consumes 1½ cords of oak wood per day, employs eight hands to work it, the stills cost alone 1200 dollars, and produce but 35 gallons of proof spirits per day, and subsist 300 swine.

"In contradiction to this, my distillery works 85 gallons of capacity, consumes ⅓ of a cord of oak wood per day, employs three hands to work it, the stills cost (including pipes, &c. &c.) 175 dollars, and produce 54 gallons of proof spirits (from grain) per day, and subsist 370 swine. From whence does all this difference arise? Nothing but the construction of the stills. It must appear obvious, by a moment's attention, that the first described form of stills is incorrect. 1st. The bottom being of a small diameter, the fire has no action on the subject within, and as rarefied heat ascends, it has but little influence on the sides. 2dly. The breast being contracted, it exposes but a small surface to evaporation. 3dly. The capital, or head, being but about one-tenth of the capacity of the still, the evaporation which does take place is too closely pressed to condense with a sufficient degree of rapidity. Hence arises the too frequent blowing off of the head of stills, to the imminent danger of workmen, and loss of property. 4thly. The worm being of a small bore, and frequently not more than ten feet in length, renders the possibility less; for it is evident that the cold bodies cannot strike sufficiently against the vapour; consequently much spirit is lost, which is forced out in the form of gas, and much, by condensation and elasticity, returns again into the still for want of a passage. The inconveniences and misfortunes which necessarily grow out of such evils are now happily remedied, and the stills which I now work embrace all the advantages derived from an opposite principle.

"1. It is necessary that the bottom of the still should be very wide and the sides shallow; by which means an exposure takes

place of the whole body of the subject to the immediate action of the fire. 2. The natural consequence of a large bottom is a large surface for evaporation. 3. The bottom should be concave, which will give the whole mass to be distilled an equal and uniform advantage of being equally exposed, and concentrates the action of the heat against the whole of the bottom. 4. The sides should be low and shallow, for the purpose of accelerating an ebullition. 5. The head should contain nearly one-half the contents of the body, in order to give room for the excessive mass of vapour which rises. There should be a rim carried round in the head to receive the portions of vapour which are condensed against the sides, and to throw it into the worm or pipes in the form of spirit. 6. The arm of the still should be at least 36 inches above the collar. This obviates the danger of blowing off the head, and detains much phlegm, and what is termed essential oil or aroma. 7. The arm should fall off in an angle of 45 degrees. This I have ascertained to be the most serviceable position. 8. The worm or pipes should be large, and semicircular or flat on the base, which acts on the principle of the still condensing rapidly, and having a large surface for cooling speedily. The spirit by this means is discharged, after running to and fro the distance of 40 feet, as cold as the water itself. It is also preferable that these should be in a trough, or lengthwise, with a fall of about twelve inches in the given distance of 40 feet. The advantage of this manner of disposing of the pipes is, that it has an opportunity of embracing all the refrigerating body of the water at once; whereas, lying in a coil, in the old form, properly called a worm, it too frequently happens that one or two rings are lying covered with hot, in the very situation where cold is most essentially necessary. 9. A cock should be placed on the breast, which should, by means of a pipe or conductor, communicate with a charging tub or vessel placed above, containing about the quantity used in charging the still: by this means the head of the still may be suffered to remain for a fortnight without the necessity of a removal, as in the old form of stills. 10. The wash or mash should be moved by means of chains, which are worked by hand, or any other power. This entirely precludes the necessity of removing the head.

"*Dimensions of the above-described Still.*

"Diameter of bottom, 45 inches.

"Depth of the body, 9 inches.

" Diameter of the collar, 18 inches.

" Height of the head from the collar, 36 inches.

" Diameter at the opening of the inverted funnel or plate, 12 inches.

" Diameter across the globular part of the capital, 26 inches.

" Diameter at the centre of the head, 18 inches.

" Diameter of the arm at the junction of the head, 9 inches.

" Diameter of the arm at the junction of the worm, 5 inches.

" Diameter of the leg at the junction of the body, 6 inches.

" Diameter of the orifice of the discharging cock, 4 inches.

" This still, which charges with 60 gallons of wash, I work off regularly every 50 minutes. The spirit is more pure than that afforded by the old stills: the quantity is greater, for I have ascertained that stills with deep bodies do not discharge all the spirit, (hence the advantage supposed to be derived by some distillers of fermenting with the exhausted wash): it is easier to work, less danger of blowing off the head, never burns, and consumes less than one half the fuel consumed under the old stills.

" These are advantages of a serious nature, and well deserve attention. Mr. Anderson's condenser, or heater, or rather both, when applied to the old still, has its advantages in a small degree. His method is to place a half globe in the charging tub, which heats the wash previous to its being committed to the still: by this means he works his stills eight or nine times in twenty-four hours. He appears to be gaining time in a double degree; but unfortunately the advantage is too dearly paid for by the total loss of at least one-fifteenth part of the quantity of spirit. This effect is caused by the excess of heat generated in the charging tub, which brings on an evaporation. He pretends that, by causing good and sufficient covers to be made to his tubs, it is again returned; but one moment's reflection must convince us, that the pores or grain of the wood is wholly insufficient to detain the volatility of the first portions of spirit. The quality also undergoes imminent danger of being injured. The excess of heat generated in the charging tub in a short time loses its condensing powers, and then becomes an evaporator in the very situation where a condenser is most wanting. Another method has been attempted, by a Mr. Richardson, to introduce the mode of heating the wash previously by copper charging vessels placed in the flues of the

furnace. This too would find its advocates, had he placed a head and worm to his charging vessel. Various other methods have been attempted to be introduced as cheap and useful stills, such as passing iron flues through wooden vessels with metal caps, &c. but these, like Joseph's coat, are composed of too many colours.

"The surplus of heat generated under the stills may nevertheless be used for valuable purposes. The most successful method which I have observed I discovered by accident. Having occasion to set up a still, and having no better situation than the malt-house of my brewery afforded, I conducted the flues into the flues of the malt kiln, and soon observed, that when my still was at work there was no necessity for a fire in the furnace of the malt kiln. It may be used with advantage by passing a small part of the pipes through the charging tub, so as to bring the wash only to a tepid or lukewarm state, or both may with safety and economy be applied. The chains, sweep and spindle should be made of brass, or copper when it can be procured: the powerful action of the acid on iron or steel destroys it in a few months. The chains daily grow lighter by the rapid decomposition; they gradually wear away, become too light to give motion to the mealy feculence deposited in the bottom, which finally burns. The friction of the chains against the bottom redoubles the decomposition; the affinity of the iron in contact with the copper also wears the bottom. To remedy this defect I have bound the chains with strong canvass, which has operated to a good effect. In working the still it is not necessary that the chains should be moved after the still works. The ebullition which takes place in the act of boiling is sufficient to keep the mucilaginous principle in motion; therefore the chains need not be worked more than twenty minutes in every charge, which is the longest time required for the still to boil. As soon as the still begins to boil, the screw resting on a socket on the head, should be drawn down, that no vapour may escape.

"Boilers of iron have been substituted in the room of those of copper, to which are attached capitals of tin. By this means the spirits are exempted from every suspicion of that dangerous metal. This substitute will necessarily soon expire, according to my own experiments. They are subject to many dangers, of more consequence than the supposed pernicious quality of copper. 1st. The boiler or body of the still, when discharged, soon becomes excessively hot, on which is charged the cold liquid; this sudden transition causes the iron to crack. 2dly.

The capital being of tin, is necessarily light: it is consequently liable to many casualties, such as bruising, contracting, &c. and, lastly, the acid corrodes the tin, which, after two or three months work, breaks suddenly into a thousand small holes of the size of a pin's head, and some needle-formed.

"These, with many others, are inconveniences which must suddenly check the spirit of using them.

"It is an erroneous opinion, too generally adopted, that copper vessels in distillation are dangerous.

"I admit that acids acting on copper in a cold state are dangerous; but so long as the still is at work, or the acids are kept hot, there is no danger to be apprehended from that source. Many distillers, after having finished the operation of distilling, suffer the charge to remain in the still to prevent the heat from destroying the copper. This is a slovenly and dangerous practice, and accounts for the many patches and new breasts on our country stills. The true cause is, that the volatile acid, when cold, ascends, and attaches itself to the breast of the still, which it corrodes in a short time: hence proceeds the dangerous quality of the metal so justly complained of, and the final loss of the stills."

Mr. K. then treats of the size and management of mashing-tubs, of the construction of furnaces, and of the motion to be given to various machinery in his distillery by means of a small water-wheel, to grind rye, &c.

He afterwards makes some practical remarks on the difference between cyder-spirits and apple-brandy, which we present to our readers. (P. 58.)

"The distinctions which are usually made in this article do not merely arise from the country, where language, by different expression, means the same thing. Cyder-spirits and apple-brandy are certainly worthy of distinction, as they comprise two different qualities of spirits.

"Yet this difference does not arise from the difference in the quality of the fruit, nor in the different methods by which they are treated in the manufacture, but by the difference in the management of the stills alone. Yet this is a misfortune so well known to all distillers, that a chapter on this subject is scarcely necessary, were it not for the probability of its bringing about a reform in practice.

"The best quality of spirits which is manufactured in the United States from apples, I have seen in the State of New-Jersey. The distilleries erected in that State, for these purposes alone, are very extensively calculated, some of which

work 1500 gallons of capacity on the old plan of stills. These works, though very expensive, are very productive. The custom in that State is to bring the apples to the distillery, where they are manufactured into cyder, fermented in large cisterns, and distilled in that form. This is truly cyder-spirits.

"The apples are by custom exchanged by the farmer at so many bushels for a gallon of spirits, commonly about five. The distiller then assorts them in different binns or apartments, according to the quality (which is distinguished by the soundness of the fruit), the mellowest or ripest being the first which require his attention. They are then put into the cant-mill, which works in the form of our tanners' bark-mills, where they are ground as fine as possible, or the hurry of business will admit of. They are then carried to the press, where they are pressed out as long as they yield any juice. (Some, after this operation, throw on water, and press again, which makes what is termed water-cyder, and is a pleasant beverage: others steep the pumice in vats for three or four hours, and again press out for the still. This latter mode is worthy of attention, as it yields a considerable quantity of spirits which otherwise would be totally lost.) After being justly pressed, it is run into vessels of various sizes, some of the capacity of thirty hogsheads and upwards, where it is suffered to go into a natural fermentation as long as is necessary. Care is taken that the pressing of two or three different days do not get together, for which case their cisterns are made proportionate to the quantity they press out daily. These presses are made with two powerful screws (those working right and left are preferable, being more convenient). The cyder, in the course of eight or ten days, (according to the weather) is fit for the still, to which it is committed. Some make up their spirits with fair water-cyder, from an idea that it is milder, and that it takes more cyder than water; but by this practice it is subject to leave a sediment at the bottom, and when removed or shaken, becomes muddy and unsightly. The practice adopted by other distillers of working the pumice in the still, is that from which results the production of apple-brandy. This article, at market, does not sell for at least six-pence per gallon so high as cyder-spirits; yet distillers think themselves amply compensated by the increase of quantity which is afforded by this mode of treatment. The apples are broken or ground in what are termed nuts, being two horizontal broad spur wheels of solid wood working into each other. After being well broken, they are thrown into casks, and diluted with water to a proper

consistency, to avoid an empyreuma, when it is suffered to ferment. In order to know when the fermentation has perfectly subsided (this being somewhat difficult), they give the cask a push, and if it sings and discharges a pungent aromatic smell, it is a proof that the fermentation has not yet subsided. When these symptoms are gone, it is then committed to the still. By this method the product differs from the other in the ratio of one-fifth.

"As the product in this process is greater than that afforded by pressing out the juice, I approve of it inasmuch as the yield is greater only. But in order to remedy the general defects of this process, it is necessary to place proper stirrers in the still to keep the pumice in motion previous to its boiling, which neglect is the sole cause of the difference in the quality of the two spirits. Another material objection arises to the practice of many distillers in making up their good with low wines. This is the ostensible cause of the difference in quality of two distilleries which work by the same process. In doubling the low wines the receiver should be removed the instant the proof is off the spirit, at the nose of the worm.

"In the autumn of 1802 I distilled upwards of 15,000 bushels of apples, all of which I pressed out and distilled in the form of cyder. I found the yield somewhat less than two quarts per bushel. I then caused my brewing copper to be filled with water, and brought to a boil, into which I threw my ground apples, and after stewing them about fifteen or twenty minutes, took them out, and diluted them with a sufficient quantity of cold water, and a small quantity of cyder in a high state of fermentation. After a complete fermentation had subsided, I committed all together to the still, and the result was a better quality of spirit than either of the two above-mentioned, and the yield greater, being full two quarts per bushel. This process displays a vast field for the exercise of genius in the improvement of our native cyder-spirit."

We pass over his observations on lutes, by merely mentioning that, for common purposes, he employs a strong paste of rye-meal, and for nicer operations, a mixture of quicklime with whites of eggs. And we do no more than mention the instructive chapter on fermentation of raw rye-meal and malt, in the proportion of 75 pounds of the former to 15 pounds of the latter, because we are in haste to copy his observations on the distillation of the various products of the United States which afford ardent spirits. (P. 86.)

"The spontaneous gifts and rewards of the bounteous Cre-

ator, who has showered down his benign influence on the multifarious products for the benefit and use of his children, demand the adoration and thanks of those of the United States, no less so than that of any other of his people.

"The multiplicity of those furnished to the United States would exhaust the patience of a reader to enumerate in their several capacities, products and results.

"Ardent spirit is afforded by almost every plant and shrub in the universe, and it only requires the means afforded by the science of chemistry to develope the proof. These, in the United States, are unfortunately enveloped in that mysterious cloud which forecloses the reach of those who stand most necessitated, and from whom the happiest advantages would result to the community.

"The variety of soil and climate in the opposite extremes of the United States, together with the serenity of the intermediate parts of it, afford us every means within the reach of man, to cultivate to advantage such esculent fruits and vegetables as are productive and profitable to the distiller. Nay, our very forests, which never have felt the fostering hand and care of man, will supply us with a variety of productions suitable to the attention of the artist of this profession. Already do we see large quantities of sugar, equal in quality to the best muscovado, drawn from the secret recesses of the forest, and distributed throughout this vast continent. Who can take upon himself to say, that all the boasted rich productions of the East will not, in some future period, concentrate themselves in the rank of the products of the United States?

"The arrack of the East-Indies is already in our possession; why may not the rum of the West-Indies also be? Our soil and climate are not in the fault.

"The general want of information in this subject, and a promulgation of this knowledge, is all that is at present necessary to give a spur to our future greatness. I shall class only the several productions which afford ardent spirits, and which may be worked to advantage at this day, in the form of results of late experiments in some, and a slight knowledge of others, for the benefit of future improvement and research; beginning with

"*The Apple.*

"The juice of this fruit (which is called cyder when expressed and fermented) affords, by distillation, one-tenth of its weight of spirit of the first proof on Dicas's hydrometer.

"For process, see chap. IX.

"*The Pear.*

"This fruit, when expressed as the apple, affords nearly the same result, the qualities differing, as the quality of the fruit differs, in the same ratio as the apple. Process the same as the apple.

"*The Peach.*

"This fruit is cultivated in abundance throughout the United States, though in greater abundance to the southward of Pennsylvania. It affords, by distillation, about one-eighth by clear expression. Although this is seldom done, it is, nevertheless, the best method to procure a fine flavour, which fixes the principal value.

"Peaches intended for distilling are gathered and thrown into bins; when the ripest should be assorted out, and thrown into a trough or vat, into which persons enter and mash them with their feet. In the Southern States wooden stampers are used (as they cannot coveniently be ground in a mill, owing to the danger of the stone.) This is a practice which might well be remedied by supplying their mills with stones, after the manner of a tanner's bark-mill. It would also be attended with the advantage of breaking the peach-stone, which would impart that rich aromatic bitter which its kernel possesses, and which is so highly prized in that celebrated cordial called noyeau. After being well macerated, it is thrown into vats or casks, and diluted with water, so as to prevent an empyreuma. In this state it is called mobby, and after a thorough fermentation, it is in that state committed to the still, together with the mass. Others press it in cyder-presses.

"*The Plumb.*

"This is a fruit which is more used in culinary purposes and for the table. But there is a kind of plumb, which grows plentifully in most parts of the United States, called the red plumb. It is of a beautiful saffron-colour, inclining to red. This fruit affords nearly the same product as the peach, and should be treated in the same manner.

"*The Cherry.*

"There is a variety of this fruit: that which affords the greatest quantity of spirit is the black-heart cherry, which should be treated precisely as the peach. This fruit is more valued for the aromatic flavour which it imparts to spirit, and from which is made the exhilarating water called cherry-bounce.

"*The Papaw*

"Is a fruit resembling seed-cucumber. Its pulp is of a saffron-colour, nearly of the consistence of a melon, and its flavour much like custard. It is too luscious, when ripe, to be agreeable to the palate; but when boiled green, is pleasant. It ripens about the middle of September, is a native of Kentucky, Maryland and Pennsylvania. The tree grows from twelve to twenty-six feet high. This fruit affords, by distillation, a spirit by some highly prized, and in considerable quantities. The process is well known to the inhabitants where this fruit grows in abundance.

"*The Blackberry, Whortleberry, &c.*

"Afford spirit in tolerable quantities, by expression, fermentation, and distillation.

"*The Sugar Maple*

"Is a tree which abounds in the northern and western parts of the United States: it grows from forty to sixty feet in height. The sap is drawn in February and March. Of this sap the inhabitants make large quantities of sugar. This sap, duly fermented and distilled, produces spirit of a very superior quality, and highly esteemed. The process is simply a fermentation of the sap, and distillation in the common way.

"*The Persimmon*

"Is a fruit so well known throughout the United States that a description is unnecessary. This fruit is fit for distillation only after a severe frost, which instantly ripens it, when it is gathered and thrown into a cistern or cask, in which state it is easily crushed and diluted with warm water, fermented, and the whole mass committed to the still. Some strain the mass through a coarse catgut, which takes out the seeds, which are of a powerful astringent quality. This spirit is not highly esteemed.

"*The Potato.*

"There are two kinds of the potato, one of which is commonly called the Irish potato, and the other the sweet potato; the latter of which affords the greatest quantity by distillation. The process is the same in both, yet the sweet potato works more kindly. After being well boiled in water (steam is the best), they are macerated by various means (a heavy roller is the best): they are then diluted with a sufficient quantity of water, and strained through a coarse canvass to separate the

skins, (this is a process which, however, may be dispensed with): they are then thrown into casks, fermented, and committed to the still. The distillation of potatoes may, in a short time, become a matter worthy of attention. At present the negroes of Georgia and the Carolinas are the only manufacturers. The spirit is of an inferior quality, and is used by the poorer class of inhabitants; but a vast field for improvement lies open.

"*Turnips, Parsnips, Carrots, Pumpkins, Cashaws, &c.*

"Afford spirit of an inferior quality, and in tolerable quanities. They are to be treated similar to the potato.

"*Grain of every Description*

"Affords spirits of different qualities, and in different quant ities, according to weight.

Wheat weighing	60lb. per bushel affords from	8 to	12 qts.
Rye	60	10	14
Indian corn	60	10	14
Buckwheat		6	8
Oats	32	5	7
Barley	45	7	9
Speltz	60	9	13
Rice	70	13	16

"The spirit afforded by the distillation of rice is what is usually termed rack, or arrack. This article is imported by us chiefly from Bengal, and is distilled from rice, although the real and genuine arrack is distilled in the island of Goa, from the sap of a tree, drawn in the same manner as our sugar maple.

"*The Grape.*

"In the United States the cultivation of the domestic grape has but just commenced: the numerous species,* however, of our wild grape, with which our forests abound, make it a matter of consideration. These being collected in sufficient quantities, when ripe, they may be treated with success after the process of the apple, and afford a beautiful spirit, not unlike cogniac.

Indian Corn (the Stalk).

"The young stalk of the Indian corn (which should be used about the time of earing), like the sugar-cane of the

* See Mr. Bartram's paper in Med. Rep. Hex. ii. vol. i. p. 19—*Ed.*

West-Indies, affords a large quantity of juice or sap by expression, which, when fermented and distilled, yields abundantly of spirit of a very superior quality. This should be broken and worked in the same manner as the sugar-cane, which is by nut-mills of iron, after the manner of our cyder-mills."

The author delivers his opinion that a certain proportion of the meal of maize, or Indian corn, worked up with that of rye, will afford a greater quantity of spirit than rye alone. This quantity of maize, he thinks, may be nearly equal to the proportion of rye.—Under the head of rectification, he treats of effecting it by re-distillation; by fixed alkaline salts; by other saline substances, such as dried common salt, calcined vitriol, alum, fine dry sugar, &c. and by what he deems preferable methods, of filtration through powdered charcoal and sand, and distilling off from slaked quick-lime.—In Mr. K.'s chapter on the malt-house, and on the advantages of malt in distilling, the reader will find, amidst other useful matter, an intelligent abstract of an English work on the distillation of European and West-Indian spirits, by Mr. Cooper. In this, brewing is treated of as a process conducive to the production of inflammable spirits; as it is also the mode of extracting of such liquors from malted (not raw) grain. To these are subjoined Sir R. Murray's manner of making malt.

The swine reared and fatted at a distillery of *raw* grain are objects of no small consideration. The author estimates, that for every five bushels of grain, worked daily, fifty hogs may be kept. And three successive sets or crops of these animals may be prepared yearly for the slaughter. Some distillers prefer the feeding of black-cattle. In this case, as well as in the other, the business is very profitable.

Gin has not been hitherto prepared as well in our country, or, indeed, any where else, as in Holland. Mr. K. in page 158, inquires into the reason of this; and declares that, by adding five pounds of juniper-berries, one pound of bay-salt, four ounces of quick-lime, one quart of strong ley, and four ounces of hops, to thirty gallons of proof spirits, he makes Geneva that will bring him eighteen pence more the gallon than the general market price of the home-distilled article.—The author's remarks on leaven and yeast, on distilling simple waters, and on preparing compound waters and cordials, will be found very useful to practical operators, more especially as they are accompanied with six dozen of choice receipts.

We should close our review without adding a sentence more,

were we not desirous of submitting to those who honour our pages with their notice, a few remarks on the mixtures and adulterations of distilled spirits. So multifarious are they, that we pretend not to know one-tenth of the foul or noxious ingredients added to the grain by the distiller, or to the liquors at market by the wholesale and retail dealers. But we understand that a practice has extensively prevailed, of depressing the true proof of the gin, by adding a large quantity of water, and then of giving a deceptive one, by means of *sulphuric* (vitriolic) *ether*. It is generally known that great skill and experience are boasted of or possessed by certain individuals in the business of *flavouring and improving spirits*. When these are rectified by distilling from alkaline salts, a portion of their vinosity is destroyed, and an urinous flavour imparted. To revive this lost spirit, and to remove this disagreeable taste, a multitude of experiments have been made. The result of the trials is, *that the nitrous acid is the best of all correctors*. Accordingly, most distillers employ this offspring of putrefaction (modified first by its connection with pot-ash, and then by its separation therefrom, Med. Rep. Hex. I. vol. ii. p. 236, and vol. vi. p. 362 & seq.), to neutralize the predominating pot-ash, and revive the impaired vinosity of their spirits. To effect this purpose, some add the *aqua-fortis, or strong acid of salt-petre*. This, however, being apt to separate, and eventually do more hurt than good, they have substituted the *spirit. nitri dulcis* in its place, which incorporates readily with the spirit, and does not very readily quit it. We understand also, though no mention is made of it in the work before us, that a practice prevails of giving to spirits, reduced low by water, a fraudulent appearance of strength in the proof-glass, as well as an approved flavour, by means of *nitrous ether*. But having stated these curious particulars, for the consideration of those who consume distilled spirits, particularly brandies, we conclude our observations.

ART. II. *Transactions of the American Philosophical Society, held at Philadelphia, for promoting useful Knowledge. Vol.* vi. *Part* I. 4to. pp. 190. *Philadelphia.* Aitken. 1804.

AMONG the pleasing events which occur so frequently in our time, the progress of those institutions that pursue the sciences, useful arts and liberal knowledge, peculiarly

deserves to be mentioned. In our country the harvest is truly great, though hitherto the labourers have been but few. But their number is increasing, and it may be confidently expected the work will go on more cheerly by the augmented proportion of hands. Notwithstanding the allurements of wealth, the agitations of party, and the workings of ambition, which produce great effects among our citizens, there is reason to believe that the votaries of philosophical and physical research are multiplying with rapidity.

The volume now before us is one of the most powerful arguments in favour of this opinion. That cluster of gentlemen in Philadelphia who possess the taste, talents and industry to prosecute inquiries of utility to their species, have heretofore surpassed, by many degrees, every other association of the kind in America. The five volumes which they have heretofore published are very reputable testimonials of their labours. Of the fourth of these we gave a review in our Hex. I. vol. iv. p. 65, 179, and 408, and in vol. v. p. 67; and of the fifth, in our vol. vi. p. 174. By reference to these valuable collections of papers, our readers will form a judgment highly favourable to the character of this learned and excellent society. Indefatigable in the pursuit of their chosen objects, they have favoured the public with another body of memoirs. These, we learn, compose only a part of the intended volume, and seem to be sent forth at an early day for the purpose of producing the good of which they are capable immediately, instead of remaining in the possession of the secretary or committee of publication, for years perhaps, until matter enough for an entire book should be collected. We therefore give it an hearty welcome in its present form, and, without any further observations, proceed to an examination of its contents.

Prefixed to the body of the work, we observe the customary advertisement of the rules adopted for the direction of committees in the choice of memoirs for publication, the list of officers for the year 1804, the conditions of the Magellanic premium, and a catalogue of books given to the library, and specimens to the cabinet, by the generosity of learned societies and individuals at home and abroad. By the titles of these donations, it appears that their amount is very considerable since the last publication was made.

The communications are thirty-one, and appear to succeed each other nearly in the order in which they were received. On examining them, we find that, of these, there belong to *Manners and Customs*, one; to *Meteorology*, seven; to *Astro-*

nomy and Mathematics, six; to *Chemistry*, three; to *Zoology*, three; to *Botany*, one; to *Geology*, two; to *Natural History proper*, four; to *Mechanic Arts*, two; to *American Antiquities*, one; and to *Philology*, one. In the remarks we have to make, we shall proceed according to this methodical distribution of the subjects. But we apprize our readers, at the same time, that we shall be less particular in animadverting upon those which lie beyond the limits of our province.

I. Under the first division is a very curious account of the language of signs or gestures employed by some of the North-American Indians. It is written by William Dunbar, Esq. of Natchez, a gentleman long distinguished for his various knowledge, his love of science, and his communicative disposition; evinced here by the six or seven other pieces which he has contributed towards the present volume. It is believed that individuals among almost all the aborigines dwelling between the Mississippi and the American Ocean use and understand certain gestures, without the aid of speech. However different their articulate sounds or spoken language may be, the tribes and nations throughout that extensive portion of the globe can hold intercourse, and comprehend each other's meaning, through the intervention of motions, chiefly of the hands and arms. These signs are devised with remarkable, indeed, with admirable skill. A moderate number of them are radical or generic, and by employing these in connection with others which are specific, a meaning is expressed with great exactness. There is, for instance, a generic sign for water; and by using this with certain specific signs, these *mutes* can signify rain, dew, cloud, fog, frost, ice, snow, hail, and other modifications of that element. And so of other things.

The ingenious and discerning writer of this memoir, having found one of those *pantomimical* natives, availed himself of the opportunity to discover all he could of this silent, though widely-extended mode of intercourse. And the description he has given of the structure and connection of these gestures is worthy the attention of all who study the philosophy of language, to learn therefrom by how many ways man holds connection with his species. Mr. D. thinks he has detected an analogy between the Chinese written characters and these American significant gestures.

II. We next notice the meteorological essays. The first of these contains a series of observations for one year, ending January 31st, 1800, made by the same industrious gentleman

who wrote the preceding dissertation, at the forest, $4\frac{1}{2}$ miles east of the Mississippi, in N. lat. 31 deg. 28 min. W. long. from Greenwich 91 deg. 30 min. and about 150 feet above the highest inundation of that river. By these it appears that the greatest rise of the quicksilver in Fahrenheit's thermometer, during that year, was 92 deg. in July; the lowest fall $19\frac{3}{4}$ deg. in February; and the mean temperature $63\frac{1}{2}$ deg. The variations of the barometer were very small, the most considerable elevation being 30.25 inches, in February; the lowest descent 29.51 inches, in April; and the medium range 29.333 inches. The annual depth of rain was 39.770 inches, of which upwards of nine fell in February, and almost five in September.

The next piece is by the same author, and contains *a description of a remarkable igneous meteor seen at Baton Rouge on the night of the 5th April*, 1800. It seemed to be as large as an house, imparted heat as it passed, proceeded from S. W. to N. E. moved very rapidly, was followed by noise, and tore up the earth and singed the vegetables where it fell.

A third paper is written by Andrew Ellicot, Esq. on an *extraordinary flight of meteors (commonly called shooting of stars) observed in November*, 1799, *on a voyage from New-Orleans to Philadelphia*. "The phenomenon was grand and awful. The whole heavens appeared as if illuminated with sky-rockets, which disappeared only by the light of the sun after day-break. The meteors, which at any one instant of time appeared as numerous as the stars, flew in all possible directions except from the earth, toward which they all inclined more or less; and some of them descended perpendicularly over the vessel we were in, so that I was in constant expectation of their falling among us." This corruscation is said to have extended over a large portion of the West-India Islands, and part of the continent.—For a similar and more extensive atmospherical illumination, which occurred in April, 1803, we refer to our vol. vi. p. 300.

Mr. Dupont de Nemours is the writer of the fourth essay belonging to this department. It is on the theory of the winds, *sur la theorie des vents*, and is printed in French. The writer ascribes winds to three causes, dilatation, condensation, and revulsion. In explaining these he has recourse to the diurnal motion of the earth on its axis, the refrigeration of mountains, the calefaction of countries abounding in sand, the obliquity of the ecliptic, the precession of the equinoxes, and some other agents, as giving a direction, force and variableness to

winds. And from observations made on each of these subjects, he endeavours to explain the trade-winds, the monsoons, eddies, whirlwinds, storms, and all other modifications of atmospheric currents, and even to account for calms. The memoir, which occupies about eight pages, is composed in a neat, and what may be called a gentlemanly style; and contains numerous indications of taste and information. But the reader is not likely to find in it any new facts, nor any thing more lucid or methodical than is extant already. How happens it that the influence of our neighbouring planet, the moon, on our atmosphere, is never once noticed by Mr. N. although he mentions almanacks, and predictions of the weather?

Fifthly. In a letter from Mr. Dunbar to the President of the society, there is an account of large fossil bones, like those near the Ohio, found at Opelousas, on the west side of the Mississippi. To this are subjoined some ingenious reflections on the refraction of prismatic light by the atmosphere on summer evenings, and on lunar rainbows. The pallid appearance of the Iris by moon-light has been observed by us, both on ocean and on shore.

Sixthly. From the same correspondent there is another *paper of meteorological observations.* They are for the year 1800, and made at the same place with the former. This year the extreme heat of summer was four degrees above, and the cold of winter $7\frac{3}{4}$ below, the temperature of the preceding. And the difference of the mean annual, nevertheless, differed only $\frac{3}{4}$ of a degree from the last year. The mercury in the barometer was nearly at the same heights. And there fell eight inches, or thereabout, less of rain. These facts are followed by observations on the season and weather, which are well calculated to give an idea of the climate near Natchez.

Seventhly. From the same careful hand there is another communication, containing the monthly and annual results of his thermometer, barometer, and huetometer, for 1801, 1802, and 1803. For the particulars of which we refer to p. 188 of the book.

III. The astronomical and mathematical disquisitions are the following:—1. *A short and easy rule for finding the equation for the change of the sun's declination, when equal altitudes are used to regulate a clock or other time-keeper.* By Andrew Ellicot, Esq. 2. *An improved method of projecting and measuring plane angles.* By Mr. Robert Patterson. 3. *Observations made on a lunar eclipse, at the Observatory, in the city of Philadelphia, Sept.* 21, 1801. By Messrs. Patter-

son and Ellicot. 4. *Astronomical observations, made at Lancaster (Penn.), chiefly with a view to ascertain the longitude of that borough, and as a test of the accuracy with which the longitude may be found by lunar observations.* In a letter from Mr. Ellicot to Mr. Patterson. 5. *A continuation of astronomical observations made at Lancaster.* By the same. 6. *Astronomical observations made by Jose Joachin de Ferrer, chiefly for the purpose of determining the geographical position of various places in the United States, and other parts of North-America.*—We should take pleasure in analysing these valuable papers, did they lie within the limits of our plan. Circumstanced as we are, we can only recommend these productions of three distinguished mathematicians to the examination of those who have a relish or comprehension of the science to which they belong.

IV. Chemical papers. The first of these is an ingenious *essay on the claying of sugar, with a new and economical mode of conducting that process.* By Jonathan Williams, Esq. On the clarification, crystallization, and moulding of sugar in the refinery, this intelligent gentleman has offered some remarks which appear to be well-founded, and conducive to practical use in the conversion of brown sugar to white.

The next is *an account of the fusion of strontian earth, and the volatilization of platina; and of a new arrangement of apparatus.* By Mr. Robert Hare, jun. In our Hex. I. vol. vi. p. 168, a review was given of the memoirs of this enterprizing and inventive chemist on the supply and application of the blow-pipe, and on the means of increasing its powers, by mixing oxygenous and inflammable gases. We also gave an extract from the work, containing an account of the great heat excited by this machine, and of its effects on various fixed bodies. Mr. H. has since, in the presence of Messrs. Woodhouse and Seybert, turned platina into vapour, by his *hydrostatic blow-pipe;* and, jointly with Professor Silliman, reduced strontites to a state of fusion. Aided by the latter of these gentlemen, he has contrived so to combine the hydrostatic blow-pipe with the pneumatic tub, as to render them very convenient in operations requiring large quantities of the airs.

The third piece is entitled, *Observations on the discovery of salt-petre in common salt which had been frequently mixed with snow.* By Dr. Priestley, in a letter to Dr. Wistar. This, by reason of its singular and important contents, we insert entire, from p. 129.

"When I had the pleasure of seeing you at Northumberland, I mentioned a fact which I had just observed, but which appeared to me so extraordinary, that I wished you not to speak of it till I had more completely ascertained it. It was the conversion of a quantity of common salt into nitre. But having seen, in the last *Medical Repository*, an observation of Dr. Mitchill's, which throws some light upon it, I think it best, upon the whole, to acquaint experimentalists in general with all that I know of the matter; that, as the experiments must be made in the winter, they may take advantage of that which is now approaching.

"In the winter of 1799 I made those experiments on the *production of air from the freezing of water*, an account of which is published in the fifth volume of the Transactions of the Philosophical Society of Philadelphia, p. 36; and having made use of the same salt, mixed with snow, in every experiment, always evaporating the mixture till the salt was recovered dry, I collected the salt when I had done with it, and put it into a glass bottle, with a label, expressing what it was, and what use had been made of it.

"This quantity of common salt having been frequently dissolved and evaporated in an iron vessel, remained till the 26th of last October; when, having occasion to make a large quantity of marine acid, and this salt appearing to be of little value, I put to it an equal weight of acid of vitriol, and about twice the quantity of water, and began the distillation in the usual way. But I was soon surprised to observe that *red vapours* rose from it, first filling the retort, and then the adopter, &c. and when the process was finished, returning to the retort, exactly as in the process for making spirit of nitre.

"Not doubting, from this appearance, but that the produce was the nitrous acid (though, having used much water, the acid was, of course, weak, and nearly colourless), I immediately dissolved copper in it, and found that it yielded as pure nitrous air as any that I had ever procured in the same way.

"Examining the salt separately, I observed that when it was thrown upon hot coals, whether those portions of it that were white, or those that were brown from a mixture of the calx of iron, it burned exactly like nitre; so that, from this appearance, I should have concluded that it had been wholly so. But that it contained some marine salt, and that the acid procured from it had a mixture of the marine acid, could not well be doubted; and this appeared to be the case both by the

acid becoming turbid by a mixture of the solution of silver in nitrous acid, and by its dissolving gold with the application of heat, so that it was a weak aqua regia.

"This conversion of common salt into nitre appeared so extraordinary, that I first thought there must have been some mistake in the *label*, though few persons, I believe, are more careful in that respect than myself. But I never had any nitre of that appearance, and, least of all, any that had in it a mixture of common salt; so that I could not doubt but that this was the same salt that I had used before for the purpose above-mentioned. That this change must have come from the *snow* with which it had been dissolved, could not be doubted; and, therefore, I resolved to repeat the experiment with the next that should fall; but seeing that Dr. Mitchill had procured an acid from hail-stones, I was instantly determined to excite other persons to repeat the experiment as well as myself, having now more confidence in my own.

"What was the acid that Dr. Mitchill procured he did not ascertain; mine was unquestionably the *nitrous*, and it must have displaced that of the common salt by a superior affinity to its base. This acid must be exceedingly volatile; for I could not produce the same effect by repeated solutions and evaporations of the same kind of salt in snow-water of long standing, a quantity of which I have always had, to use occasionally instead of distilled water.

"The manner in which nitrous acid may be formed in the atmosphere is easily explained on my hypothesis of the composition of that acid; since I have always procured it by the decomposition of dephlogisticated and inflammable air, together with a small mixture of marine acid (which must, therefore, be formed from some of the same elements), as Mr. Cavendish procured it by the decomposition of dephlogisticated air, both of us using electric sparks.

"Now, it is probable that, although most kinds of air, even those that have no chemical affinity, will remain diffused through each other, without any sensible separation, after being mixed together, yet in the upper regions of the atmosphere, above that of the winds, there may be a redundancy of inflammable air, which is so much lighter than any other kind of air, as Mr. Kirwan and others suppose, and that there is a proportion of dephlogisticated air in the same region, cannot be doubted. In this region there are many electrical appearances, as the aurora borealis, falling stars, &c. and in the lower parts of it thunder and lightning; and by these means the two

kinds of air may be decomposed, and a highly deplogisticated nitrous acid, as mine always was, procured. This being formed, will, of course, attach itself to any snow or hail that may be forming in the same region at the same time, and by this means be brought down to the earth; confirming, in this unexpected manner, the vulgar opinion of nitre being contained in snow. Wishing that a fact of so extraordinary a nature, and which has probably more important consequences than I can foresee, may be further investigated by your presenting this communication to the Philosophical Society, I am, &c."

(To be continued.)

ART. III. *Tableau du Climat et du Sol des Etats Unis d'Amerique; suivi d'Eclaircissemens sur la Floride, sur la Colonie Française au Scioto, sur quelques Colonies Canadiennes et sur les Sauvages. Enrichi de quatre Planches Gravèes, dont deux Cartes Geographiques et une Coupe figurèe de la Chute de Niagara. Par* C. F. Volney, *Membre du Senat Conservateur, de l'Institut National de France, Membre Honoraire de la Societè Philosophique de Philadelphie, de la Societè Angloise-Asiatique de Calcutta, des Athenèes d'Avignon, d'Alencon, &c. &c. Tom.* i. *et* ii. 8vo. p. 532. *Paris.* Courcier & Dentu. 1803.—i. e. *A Picture of the Climate and Soil of the United States of America; followed by Explanations concerning Florida, the French Colony on the Scioto, certain Canadian Colonies, and the Savages. Embellished with four Copperplates, two of which are Geographical Charts, and one a figured Section of the Fall of Niagara. By* C. F. Volney, &c. &c.

ART. IV. *A View of the Climate and Soil of the United States of America; to which are annexed, some Accounts of Florida, the French Colony on the Scioto, certain Canadian Colonies, and the Savages or Natives. Translated from the French of* C. F. Volney, &c. 8vo. pp. 503. *Landon.* Johnson. 1804.

IN a note to the fifteenth chapter of his History of the Decline and Fall of the Roman Empire, Mr. Gibbon paid Mr. Volney an handsome compliment for the instructive and judicious manner in which he had written his Travels in Syria and Egypt. Other readers applauded the successful researches

he had made in those parts of Asia and Africa. And so many persons had expressed favourable sentiments of the knowledge displayed in his work, of the method which pervades every part of it, and of the spirited style of the narrative, that the author had acquired a large share of reputation both as a writer and a traveller.

For some years after his return to France, he seems to have enjoyed in repose the consideration and fame he had obtained. And in all probability he would have continued to reside there, or in some other part of Europe, had not the violence and fury of the French Revolution driven him, in 1795, to the United States. Here he resided until 1798. During that period of three years he was chiefly employed in gathering information, by conversation with intelligent men, and by journies through several of the States and territories, concerning the actual condition of the country.

The result of his observations on the geology and meteorology of the United States is here offered to the public. In treating of these subjects he has not followed the course of a meagre journalist or itinerary, but has digested his matter into distinct chapters, each forming, as it were, a regular treatise, but, at the same time, possessing a due connection with the rest. And had he confined himself merely to disquisitions of a physical nature, we should have expressed a more favourable opinion of his work than we now can, seeing that he mingles with his philosophy angry and disrespectful remarks against our government (p. 5 and 10 of the preface), fastidious criticisms on the diet and regimen of the inhabitants (tom. ii. p. 349), and a most unfavourable judgment of the climate, as inferior by far, in point of goodness, healthiness, and pleasantness, to that of France, and of all the countries bordering on the Mediterranean, of Egypt, and of Syria itself (tom. ii. p. 357).

All this we can excuse in a man who writes under the prejudices of his sensations and of his native constitution (*sans renoncer aux prejugès de mes sensations et de ma constitution natale*). There is some explanation to be given, too, of his state of mind and body, both adverse to a calm and dispassionate survey of things: for he left France in a fit of disgust (preface, p. 1); he suffered in America two very severe attacks of malignant fever, five or six violent colds, and rheumatic affections which have proved incurable (p. 304); he had been attacked in the newspapers as a suspected alien; and he seems to have departed from the United States in no better humour than he

entered them. Great allowance is to be made for the fretfulness and peevish temper of a person who is agitated by persecution and pain. And his peculiar situation may plead his apology for not having discovered that longevity is frequent among the people living in the variable atmosphere which he so loudly condemns; that habit reconciles the Americans, of English and German extraction, to the reprobated warm breakfast (p. 349) of tea or coffee, with buttered toast, and a relish of cheese or ham; and that a predilection among the body of our citizens for the manners of the people whence they sprang, is not, by many degrees, so deserving of blame as the partiality, amounting in some cases to weakness and almost to puerility, shown with such tedious repetition by Mr. V. a philosopher, in favour of usages that are French. We should be much pleased to peruse a review of his Travels in the Ottoman Dominions, by some sensible Turkish Effendi, that we might discover whether that work, which was composed when he was young, gay, and good-humoured, abounds with such severe animadversions upon the subjects of the East as he has vented against the citizens of the West.

He has delivered his sentiments concerning our country without hesitation or reserve, and we are glad that he has done so. We can read his censures without feeling any resentment, and shall strive to profit by them. And we hope he will endeavour to do the like when he shall read the account of his book which we present to our fellow-citizens.

He expects that his publication will undergo a rigid scrutiny from the Americans. It is proper that it should: not, however, for the whimsical reason he assigns, of contradicting Europeans, because, in so doing, the Americans are avenging the wrongs done to their predecessors the savages; but for the laudable and just purpose of correcting the blunders, exposing the misrepresentations, and repelling the calumnies, which certain vain and superficial scribblers in Europe delight to propagate concerning America and its inhabitants, whether indigenous or derivative, brute or human.

Mr. V. informs his readers that it was his intention, on returning to France, to have offered to his countrymen a work on the climate, soil, population, emigration, habits, manners, occupations, ideas and prejudices of the American States. He intended to have traced their history, language, laws and customs, and exposed the romantic error of those writers who call them a *new and virgin people.* He designed to have investigated their organization into public or political bodies,

with the character and peculiarities of each, and their causes. These, and a multitude of other things, pompously detailed between the 4th and 14th pages of his preface, he *intended* to have written. He had even drawn the sketch, and made, in some of the parts, considerable progress. But having been delayed in the execution, by private business, public employment, and serious illness, he resolved to print only the view of the soil and climate, which might be detached from the rest without injury, and read as a distinct performance. How long the anxious citizens of the United States shall be obliged to wait for the political and economical remainder of the work, does not appear, as yet, to have been declared. We would recommend to them patience, as, in the mean time, we administer to them the comfort of what is contained in the book now lying before us. And of this, as a scientific inquiry, apart from the national reflections, personal irritations, and snarling cavils, which disgrace it, we feel pleasure in expressing our favourable opinion. The author has taken an enlarged and philosophical survey of the geographical structure of Fredish America. He has given a better history of our atmosphere, and its currents or winds, than any we have seen before. And although we differ from him in some of his conclusions, candour obliges us to own that Mr. V. possesses a happy talent for inquiry and observation; and that, generally, his arrangement and method are so excellent as to be highly worthy of imitation by those who write on similar topics.

The work consists of twelve chapters: and an Appendix of seven papers, containing elucidations of different articles contained therein. After some remarks on the situation, boundaries and extent of the United States, he divides their territory into four climates. This distribution, with the comparative observations which precede it, we present in the words of the London translation:

"Now, if we compare the United States with the countries in similar latitudes of our hemisphere, we shall find that their southern parts, as Georgia and Carolina, correspond to Morocco and the coast of Barbary, almost to the shores of Egypt; and it is remarkable, that the mouths of the Mississippi coincide with those of the Nile, but in an opposite direction; these in the latitude of 31 deg. those of 29 deg. the Nile flowing from the south, the Mississippi from the north, both with nearly the same phenomena of inundation, wealth, and excellence. The analogy of the country of America may be continued through Syria, the centre of Persia, Tibet, and the

centre of China. Savannah, Tripoli, Alexandria, Gaza, Bussorah, Ispahan, Lahor, Nankin, are, within a degree, under the same parallel. The northern parts, on the other hand, as Massachusetts and New-Hampshire, answer to the south of France, the centre of Italy, Turkey in Europe, the Black Sea, the Caspian, the deserts of Tartary, and the north of China: Boston and Barcelona, Ajaccio and Rome, to which we might almost add Constantinople and Derbend, are likewise, within a degree, under the same latitude. From these comparisons we may infer great diversity of climate; and, in fact, the United States include the extremes of all the countries I have mentioned, though we observe in them a gradation with respect to their latitudes, and still more with respect to the level of the surface, in which certain peculiar characteristics lead me to distinguish four principal divisions.

"The first, that of the coldest climate, includes the North-eastern States, as they are called, or New-England, the natural boundary of which is traced by the southern side of Rhode-Island and Connecticut on the ocean, and interiorly by the chain of hills that furnishes the waters of the Delaware and Susquehannah.

"The second, which I call the middle climate, applies to the central States, that is, the south of New-York, Pennsylvania, and Maryland, as far as the River Potowmack, or, to speak more precisely, to the Patapsco.

"The third, that of the hot climate, comprises the Southern States, or the flat country of Virginia, the two Carolinas, and Georgia, as far as Florida, where frost ceases to be known in the latitude of 29 deg.

"The fourth is the climate of the Western States, Tenessee, Kentucky, and the Territory North-west of the Ohio, or North-western Territory, lying behind the Alleghany chain, and on the west of the preceding States. The distinguishing characteristic of this climate is, that it is hotter, by nearly three degrees of latitude, than the corresponding country toward the Atlantic, though separated from it solely by the Alleghany Mountains."

The reader may be amused with his description of the aspect of the country, though he may not be wholly convinced of its justness. He may think the *picture* is distorted into *caricature*. That intermixture of cleared ground and timberland, of arable fields and verdant woods, which is the pride and ornament of our land, does not seem altogether pleasant to our French traveller, who calls the country an almost uninterrupted forest, and divides it into three wildernesses:

"To a European traveller, and more especially to one accustomed, like me, to the naked lands of Egypt, of Asia, and on the borders of the Mediterranean, the prominent feature of the American soil is a wild appearance of almost uninterrupted forest, which displays itself on the shores of the sea, and continues growing thicker and thicker as you proceed into the interior of the country. During the long journey I made, in 1796, from the mouth of the Delaware through Pennsylvania, Maryland, Virginia, and Kentucky, to the River Wabash; thence to the north, through the North-western Territory, as far as Fort Detroit; then by the way of Lake Erie to Niagara and Albany; and the year following, from Boston to Richmond in Virginia; I scarce travelled three miles together on open and cleared land. Every where I found the roads, or rather paths, bordered and over-shadowed with coppices or tall trees; the silence and sameness of which, the soil in some places parched up, in others marshy, trees fallen through age, or blown down by storms, and rotting on the ground, with the tormenting swarms of breeze-flies, moschettoes, and gnats,* do not possess all the charms that our romance-writers dream of amid the smoke of a city in Europe. It is true, on the shores of the Atlantic this continental forest displays some openings, formed by the brackish marshes, and the cultivated fields that are continually extending round the absorbing focus of the cities. It has also considerable vacancies in the western countries, particularly from the Wabash to the Mississippi, toward the borders of Lake Erie and the River St. Lawrence, in Kentucky, and in Tenessee; where the nature of the soil, and still more the ancient and annual conflagrations of the savages, have produced spacious deserts, called savannas by the Spaniards, and *prairies* by the Canadians, as also by the Americans, who have adopted this word. These deserts I cannot compare with those I have seen in Syria and Arabia, but rather with what are called the *steps* or deserts of Tartary; the savannas, like the *steps*, being covered with thick shrubby plants, three or four feet high, exhibiting, during summer and autumn, a rich tapestry of verdure and flowers, very seldom to be seen in the bare and naked deserts of Arabia. Throughout the rest of the United States, particularly in the mountainous parts of the interior country, from which the rivers flow in opposite directions, some to the Atlantic, others to the Mississippi, the realms of forest have experienced but

* "A small black fly, worse than the guat of Europe."

slight infringements on their domain; and, compared with France, we may say that the entire country is one vast wood.

"If the whole of the country could be taken in at one view, we should perceive this forest to be divided into three grand districts, distinguished from each other by the kind, species, and aspect of the trees that compose it. The species of these trees, according to the remark of the Americans, indicate the nature and qualities of the soil on which they grow.

"The first of these districts, which I call the southern forest, includes the maritime parts of Virginia, of the two Carolinas, of Georgia, and of the Floridas, and extends, generally speaking, from Chesapeak-Bay to the River St. Mary, on a soil of gravel and sand, occupying in breadth from eighty to a hundred and thirty miles. The whole of this space, covered with pines, firs, larches, cypresses, and other resinous trees, displays a perpetual verdure to the eye, but would not be, on this account, the less barren, if the sides of the rivers, land deposited by the waters, and marshes, did not intermingle with it veins rendered highly productive by cultivation.

"The second district, or middle forest, comprises the hilly part of the Carolinas and Virginia, all Pennsylvania, the south of New-York, all Kentucky and the North-western Territory, as far as the River Wabash. The whole of this extent is filled with different species of the oak, beech, maple, walnut, sycamore, acacia, mulberry, plumb, ash, birch, sassafras, and poplar, on the coasts of the Atlantic; and, in addition to these, on the west, the cherry-tree, horse-chesnut, papaw, magnolia, sumac, &c. all of which indicate a productive soil, the true basis of the present and future wealth of this part of the United States. These kinds of forest trees, however, do not any where entirely exclude the resinous, which appear scattered throughout all the plains, and collected in clumps on the mountains, even of the lower order, as the chain in Virginia called the South-west: and it is a singular circumstance, that here they deviate from their customary designation of sterility, for the fat and deep red soil of this chain is extremely fertile.

"The third district, or northern forest, likewise composed of pines, firs, larches, cedars, cypresses, &c. begins from the confines of the former, covers the north of New-York, the interior of Connecticut and Massachusetts, gives its name to the State of Vermont,* and, leaving to the deciduous forest-

* "Formed from the French *Verd-Mont*, which the people have adopted

trees only the banks of the rivers and their alluvions, extends, by the way of Canada toward the north, where it soon gives way to the juniper, and the meagre shrubs thinly scattered among the deserts of the polar circle.

"Such is the general aspect of the territory of the United States:—an almost uninterrupted continental forest—five great lakes on the north—on the west extensive savannas—in the centre a chain of mountains, their ridges running in a direction parallel to the sea-coast, the distance of which is from fifty to a hundred and thirty miles, and sending off to the east and west rivers of longer course, of greater width, and pouring into the sea larger bodies of water than ours in Europe; most of these rivers having cascades or falls from twenty to a hundred and forty feet in height, mouths spacious as gulfs, and on the southern coasts marshes extending above two hundred and fifty miles in length—on the north, snows remaining four or five months of the year—on a coast of three hundred leagues extent, ten or twelve cities, all built of brick, or of wood painted of different colours, and containing from ten to sixty thousand inhabitants—round these cities farm-houses, built of trunks of trees, which they call *log-houses*, in the centre of a few fields of wheat, tobacco, or Indian corn; these fields separated by a kind of fence made with branches of trees instead of hedges, for the most part full of stumps of trees half burnt, or stripped of their bark and still standing; while both houses and fields are enchased, as it were, in masses of forest, in which they are swallowed up, and diminish, both in number and extent, the further you advance into the woods, till at length, from the summits of the hills, you perceive only here and there a few little brown or yellow squares on a ground of green. Add to this a fickle and variable sky, an atmosphere alternately very moist and very dry, very misty and very clear, very hot and very cold, and a temperature so changeable, that in the same day you will have spring, summer, autumn, and winter, Norwegian frost and African sun. Figure to yourself these, and you will have a concise physical sketch of the United States."

Having thus arranged the territory of the United States, first into *four* great climates, and, secondly, distributed it into *three* vast forests, Mr. V. proceeds to deliver his opinion on its ge-

from partiality to the French of Canada, and which is the translation of the English name, *Green-Mountain*."

["A writer in the American Museum more naturally supposes Green-Mountain to have been changed to Vermont for the sake of euphony."—*Tr.*]

neral configuration, particularly as marked out by its mountains and plains. His survey and division of it into *three* regions are contained in the following quotation:

"To conceive properly the general construction of this vast country, we must acquire a more particular knowledge of the chain of mountains that forms its predominant feature. This chain begins in Lower Canada, at the mouth of the River St. Lawrence, on its southern bank, where its capes are called by seamen Mounts Notre-Dame and Magdalen. As it proceeds up the river it gradually diverges from it, and separating the waters of its basin, toward the north-west, from those of New-Brunswick, Nova-Scotia, and the District of Maine,* to the south-east, it traces the frontier of the United States on this side as far as New-Hampshire. There it takes a nearly southern direction, penetrating into the interior of Vermont under the name of the Green-Mountains, dividing the basin of the River Connecticut from that of Lakes Champlain and George; and after having sent off branches on that side, which repel the sources of Hudson's-River on the west and north-west, it crosses this river at West-Point by a very rugged chain, which has acquired the name of the Highlands. At this place the chain may be said to experience a double interruption: in the first place, being intersected by the waters; in the next, because it has hitherto consisted of granite, while its continuation is of sand-stone. The head of this continuation proceeds higher up the western bank of Hudson's-River to the group of the Catskill Mountains, and a mass which furnishes the sources of the Delaware. From this place branches off a band of mountainous ridges, which, after having incorporated themselves with the preceding chain, extend from north-east to south-west, across the States of New-York, Pennsylvania, Maryland, and Virginia, increasing their distance from the sea as they proceed southward. It is a singular fact in geography, that several of these ridges intersect at right angles the course of the largest rivers of the United States that run into the Atlantic, leaving a passage for them only through breaches, which attest, that the force of the waters alone has overcome the obstacle opposed to their passage. These ridges, having continued parallel to each other till they arrive at the frontiers of Virginia and North-Carolina, unite there into a knot, which I call the Alleghany Arch, because the principal chain

* "Maine is, at present, only a district of Massachusetts, but it cannot be long before it is formed into a separate State."

embraces there in a curve all its collaterals from the east. A little farther south, but still in North-Carolina, a second knot unites to the Alleghany all its collaterals from the west,* and forms a culminating point of heads of rivers; the great Kanhaway issuing from it toward the north, the Holston, or northern branch of the Tenessee, toward the west, and the Pedee, the Santee, and all the other rivers of the two Carolinas, toward the east. From this knot likewise runs off to the west a ridge of mountains, which, by one bifurcation to the north-west, furnishes the numerous branches of the Kentucky; and by a second, directly west, stretches, under the name of the Cumberland Mountains, across the State of Tenessee; where it divides north and south the basin of the rivers Tenessee and Cumberland, till they open into the Ohio: while the proper Alleghany chain, left almost alone, continues its course to the south-west, and completes the boundary of the two Carolinas and Georgia, where it receives the various names of White Oak, Great Iron, Bald, and Blue Mountains. When it reaches the angle of Georgia, it changes both its direction and name, and proceeding due west to the Mississippi, under the names of Apalachian and Cherokee Mountains, it becomes the line of division between the basin of the Tenessee on the north, and the numerous rivers that run south through the Floridas into the Gulf of Mexico. The long continuity of this chain has obtained it the name of the Endless Mountains from the northern savages. The French and Spaniards, who first became acquainted with it in Florida, applied to it, throughout its whole extent, the name of Apalachian, which was that of a tribe of savages, and is still retained by a considerable river of the country:† but the English and American geographers, who knew it in the north, have constantly given it the name of Alleghany, which I conceive to be the Indian word for Endless, as it is rendered by Evans, who appears to consider these terms as synonimous. I shall not attempt to dispute the preference which the less sonorous name of Alleghany has obtained over that of Apalachian; but, for greater clearness, I shall distinguish by the name of Apalachian that branch which, as I have observed, turns off at the angle of Georgia, and which, less steep and lofty, is divided into a number of hills and ridges, that cover the country as far as the Mississippi, terminating abruptly there in rugged precipices, called cliffs,

* "The ridges of Kentucky."

† "Apalachicola, a compound word, *cola* being the term for river in the Creek language."

which continue from the Natchez nearly to the mouth of the Ohio. These hills do not cross the Mississippi, the opposite bank of which is low and flat, being a marsh of fifty miles breadth on a medium, from its mouth to that of the Ohio, which is seven degrees, or 480 miles distant. There the continental forest terminates, and those *steps* or savannas begin, which extend westward to the mountains on the north of Mexico and the Stony Mountains, which, in the course of this work, I shall call the Chipiwan chain, from the name of those savages by whom it is inhabited.

"From this arrangement of the land, which I have just described, arises a sort of natural division of the United States into three long parallel countries in the direction of the coast, or from north-east to south-west.

"The first of these is the eastern, lying between the ocean and the mountains, commonly called the Atlantic coast.

"Another is the western, situate between the mountains and the Mississippi, and named the western or back country.

"A third is that of the mountains themselves, being intermediate to the other two.

"All of these countries having their climate, soil, configuration, and interior structure, marked by peculiar characteristics, it appears to me proper to enter into a few particulars respecting each."

But for these, as respect the two former parallel *stripes*, we must refer to the work, as, although very interesting, they are too long for insertion in our review; especially as we extract his description of the middle stripe, or mountain-country, as it extends from north-east to south-west, divides the streams of water which run into the Atlantic from those which glide into the Mississippi, the St. Lawrence, and its lakes, and produces notable effects upon the atmospheric currents on both sides of it:

"The third parallel stripe is that line of mountainous country already mentioned, which extends from the mouth of the St. Lawrence to the confines of Georgia, divides the waters of the east and west, and forms a lofty rampart or terrace between the countries of the Atlantic and Mississippi. Its length may be estimated at a thousand miles, and its breadth, which is very variable, pretty generally from seventy to a hundred and twenty.

"This division, though comparatively very narrow, has, notwithstanding, great influence on the temperature of the two adjacent, from which it differs in climate, soil, and even

produce. Toward the south the air is more pure, more dry, more elastic, more healthy: toward the north, commencing with the Potowmack, mists and rain are more common, the animals are larger and more lively, and the forest trees, without being as large as those on the west, are superior to those of the east, and excel both in elasticity.

"This chain of mountains differs from ours in Europe in being longer and more regular in its ridges than the Alps or Pyrenees, yet much less lofty. Measurements made with accuracy, at various points, will afford instructive and satisfactory proofs of this.

"In Virginia, Otter-Peak, the highest land in all the country, is only four thousand feet high.*

"In the same district, Mr. Jonathan Williams,† setting out from the point where the tide-water ceases to flow below Richmond, and measuring his route to the first chain of Blue-Ridge, found 1150 feet elevation at Rockfish-Gap. A peak near gave him 1822 feet. Further on, beyond the town of Staunton, ascending a chain of the Alleghanies, he found 1898 feet: a second chain, that of Calf-Pasture, gave him 2247: and, lastly, a third, that which divides the rivers, and is intersected by none, measured six miles south-west of Red-Spring, gave him 2706 feet.

"Consequently the Alleghanies, which I have crossed myself in this part, where they appeared to me to be loftiest, are not more than 2706 feet, or 405 toises, above the level of the ocean. Blue-Ridge, at the opening of Harper's Ferry, below the mouth of the River Shenandoah, appeared to me to have nearly the same height as at Rockfish-Gap; accordingly its mean height may be estimated at 1150 feet, that is, less than half the height of the Alleghanies in Virginia.

"In Maryland, George Gilpin and James Smith took the following levels in 1789.

"On the River Potowmack, from the limits of the tide, that is to say, from the rapids of Georgetown to the mouth of Savage-River, in an extent of 218 miles, the ascent is 1160 feet. In this account the rapids of Georgetown are taken at 37 feet, and the great fall of Matilda, including its rapids, which extend three miles above it, at 76 feet.

"From the mouth of Savage-River to the place called

* "See Jefferson's Notes on Virginia, p. 29."

† "Nephew of Dr. Franklin, and author of several papers in natural philosophy, inserted in the American Museum, and the Transactions of the Philosophical Society at Philadelphia."

Moses Williams on the summit of the Alleghanies, in a space of eight miles and three quarters, the ascent is 2097 feet, making in the whole 3257.

"In Pennsylvania, the height of the Alleghanies above the flat country, according to Dr. Rush, is only 1300 feet; and, in fact, travellers observe, that we arrive at them by a series of gentle and gradual ascents, which are scarcely noticed.

"In the State of New-York, the highest peak of the Catskill Mountains, measured, in 1798, by Peter Delabigarre,* was found to be 3549 feet above the level of Hudson's-River, in which the tide flows ten miles above Albany.

"In Vermont, Killington Peak, measured by Samuel Williams as the loftiest of all the chain, is only 3454 feet.†

"Lastly, the White-Mountains in New-Hampshire, which are visible thirty leagues at sea, and which Mr. Belknap estimates, from the accounts of travellers, at 10,000 feet,‡ are reckoned by S. Williams, who assigns his reasons, at 7800 feet only.

"The Alleghany chain, therefore, can be considered only as a rampart of the mean height of 2000 or 2400 feet, about 350 or 400 toises, which differs altogether from the grand chains of our globe; as, for instance,

The Alps, estimated at	1500 toises.
The Pyrenees,	1350
The Andes,	2500
Libanus,	1453

And it is obvious that this circumstance must have considerable influence on the meteorology of the United States, and the whole of their continent, as I shall show more particularly hereafter.

"All European travellers remark, with surprise, that the American mountains have more regularity in their direction, greater continuity in their ridges, and less inequality in the line of their summits, than the mountains of our continent. These characteristics are particularly striking in Virginia and Maryland, in the chain called Blue-Ridge. This chain, which

* "Transactions of the Society of New-York, Part ii. p. 128."

† "See History of Vermont, by S. Williams, p. 23. It is in one volume 8vo, printed at Walpole, in New-Hampshire, 1794. The author observes, that in these latitudes the region of constant frost is at 8066 feet. Mr. S. Williams, who must not be confounded with Jonathan, was formerly Professor of Mathematics at Cambridge, near Boston, and a clergyman, but at present lives retired in the State of Vermont."

‡ "History of New-Hampshire, by Belknap, vol. iii. p. 49. See also S. Williams' work, p. 23."

I have traversed or pursued the direction of from the frontier of Pennsylvania to James-River, always exhibited to me the appearance of a terrace elevated ten or twelve hundred feet above the plain, with a very steep ascent, and a summit so even, that we scarcely perceive its undulations, or the few gaps that serve for passages across it. The base of this mass is only from four to six miles broad. Approaching the north the height of this chain, as well as of those that are parallel to it, decreases; and as some of its ramifications have occasioned in Pennsylvania a confusion of names, by which even geographers are perplexed, I will endeavour, in the first place, to elucidate them.

"In Virginia three principal well-marked ridges are clearly to be distinguished.

"1st. Blue-Ridge, situate most easterly, which derives its name from its blueish appearance at a distance, to those who come from the flat maritime country. It bears the name of South Mountain in the maps of Evans and other geographers, without any good reason being assignable for the term. Indeed, the mountains of the United States, in general, named at hap-hazard by the colonists of each district, have but unmeaning, and frequently whimsical names. However this may be with respect to Blue-Ridge, it branches off from the grand arch or knot of the Alleghanies, and is even the most direct prolongation of that chain, as you come from the south. It crosses James-River below the junction of its two superior branches, the Potowmack below the Shenandoah, the Susquehannah below Harrisburg; and travellers observe, that the bed of this river, navigable so far on a calcareous bottom, becomes impassable in consequence of the rocks and sand-stone of Blue-Ridge. In Pennsylvania this ridge, less continuous and of inferior elevation, assumes, in different districts, the various names of Trent, Flying, and Oley Hills; but it is, nevertheless, the same branch, which crosses the Schuylkill below Reading, the Delaware below its western branch and the town of Easton, and proceeds to lose itself in the Catskill group towards the banks of Hudson's-River.

"The second chain, called North Mountain with as little reason as the preceding is named South, branches off likewise from the grand arch of the Alleghanies, and running parallel with Blue-Ridge, but west of it, crosses the upper branches of James-River twelve or fourteen miles above their junction, and the Potowmack four-and-twenty miles above the Shenandoah; but when it reaches the west branches of Conego-

cheague-Creek, it divides into several ramifications, which renders its remaining part doubtful. Some geographers look on the Tuscarora chain, though divergent, as its continuation; which, after having crossed the river Juniata, loses itself in the rocky and marshy deserts north-east of the Susquehannah. Others follow North Mountain in the chain of Kittatinny, which, continuing in a more direct line, runs parallel with Blue-Ridge as far as the Delaware, which it passes above its west branch and the town of Nazareth, then proceeding along the east bank of that river, and terminating with the branches of Blue-Ridge in the Catskill group and the mountains that separate the sources of the Delaware from the course of Hudson's-River.

"In Pennsylvania, Blue-Ridge and North Mountain are pretty commonly confounded together, because, as the characteristics of the two are not very distinctly marked, each district applies the epithet of Blue to its most elevated chain, and a particular name to each different ramification: but the geographical continuity of North Mountain in the Kittatinny, and of Blue-Ridge in the Flying and Oley Hills, as I have traced them, appears to me best established by the general direction of these chains, by the nature of their stones, and by their concurrence in forming a calcareous valley, which is prolonged uninterruptedly between them from the Delaware and the townships of Easton and Nazareth to the sources of the Shenandoah beyond Staunton.*

"The third principal chain, that of the Alleghanies properly so called, is the highest ridge to the west, which, separating all the rivers, without being cut by any one, has pro-

* "It is not without a careful examination of this question, that I differ from the projection of Mr. Arrowsmith, who, totally neglecting the ridge of Oley Hills and Flying Hills, turns off the chain of Blue-Ridge into the Kittatinny below Harrisburg. This geographer may have had notes made by travellers, who, influenced by the vulgar opinion of the settlers in Pennsylvania, and by the name of Blue-Ridge, which they give in some districts to the Kittatinny, had adopted this system. But in addition to the authorities of Evans, Fry, and Jefferson, which I deem of superior weight, I have myself seen, when crossing the Susquehannah on the road from York to Lancaster, a chain, a mile above the ferry at Columbia, that is evidently a prolongation of Blue-Ridge, which may be seen for a long while on the west of this road, more or less distant. This chain, equal in height on both banks, leaves the river only a narrow passage over a rapid; and every thing attests, that the water has forced its way, like that of the Potowmack below Harper's Ferry. It continues its course north-north-east. The bed of the river, at the ferry near Columbia, is calcareous."

perly received the name of Endless. This chain, taking it at its southern extremity, comes from the angle of Georgia and Carolina, where it receives the various names of White-Oak, Great-Iron, Bald, and even Blue Mountains. There it sends off to the west some branches of the river Tenessee, and to the east the rivers of the two Carolinas, of which it forms the western frontier. On reaching Virginia it forms the arch I have mentioned, by bending toward the north-west, and enveloping the preceding ridges: it then resumes its course north-north-east, and sends to the Ohio the waters of the Great Kanhaway, and Monongahela—to the Atlantic those of the rivers James, Potowmack, Susquehannah, &c. but toward the sources of the western branch of the latter it divides into several ramifications, the most considerable of which proceed to the eastward, and, crossing all the streams of the Susquehannah, terminate in the Catskill Mountains, and at the sources of the Delaware and Hudson; while other ramifications to the east surround the sources of the Susquehannah itself, and proceed by Tioga to furnish those of the lakes of the Iroquois or Genessee country: unless, indeed, it should be thought proper to assign these branches to a ridge farther west, which, under the names of Gauley, Laurel, and Chesnut-Ridge, likewise terminates in this country.

"Beside the three principal chains of Virginia, which I have just described, there are still several intermediate ridges, which frequently equal them in height, steepness, and continuity; as those of Calf-pasture, Cow-pasture, and Jackson, which I crossed in travelling to Staunton by the way of Green-Briar. In the latter mountains are thermal waters of different qualities, celebrated in Virginia for their virtues, and known by the names of Warm-Spring, Hot-Spring, Red-Spring, &c. Warm-Spring, which I have visited, is an ammoniacal sulphureous water, about 20 deg. (77 Fah.) of heat. It rises in the bottom of a deep valley, shaped like an inverted cone, which has every indication of having been the crater of a volcano now extinct.

"West of the Alleghanies, toward the basin of the Ohio, there are likewise several remarkable ridges. I crossed one known by the name of Reynick* and High Ballantines, eight miles west of the town or village of Green-Briar, and it appeared to me as lofty as Blue-Ridge, but much broader. From

* "The name of the earliest or principal settler on the road. Almost all the names of places in the United States have a similar origin."

the plain on its summit I saw a number of others toward the south-west and north-east. Fifteen miles farther on I entered by a winding road into a series of other chains, eight or ten of which I crossed in the space of thirty-eight miles, till I reached Gauley, the highest and steepest of all, and the narrowest on its ridge. This whole space of thirty-eight miles I consider as one lofty terrace. Beyond the Gauley Hills we cross no other high chain, except with the course of the rivers, the direction, and often, indeed, the bed of which we follow; but I have observed, that the bed of the Great Kanhaway often makes its way through one of the roughest countries I ever saw. Many of these ridges direct their course to the Ohio, and we shall see that some must have crossed it. This Gauley-Ridge commences with the sources of the Great Kanhaway to the south-west of the Alleghany arch, and, under the names of Laurel-Hill and Chesnut-Ridge, proceeds northward, to terminate at the head of the Susquehannah. Southward the settlers in Kentucky and Tenessee have extended the name of Great Laurel to the principal branch, that separates Kentucky from Virginia; and have given the name of Cumberland to its continuation, which accompanies and bounds Cumberland-River as far as its mouth. I have not sufficient documents with respect to this part. The government of the United States has in its power a very simple mean of procuring itself a complete collection: this is, to oblige all the surveyors, by a statute of the college of William and Mary at Williamsburgh, where they undergo their examination, and receive their patent, to add topographical details to the barren accounts of their measurements. Thus, in a few years, a complete system of the mountains and rivers would be obtained without expense.

" It remains for me to give what information I could procure respecting the internal structure of these mountains, that is, the nature and arrangement of the stony strata that form their nucleus. Incomplete as these may be, I have reason to presume they will not be uninteresting, were it merely for their novelty, their connection, and the pains I have taken to give satisfaction to those readers who attach to the science of physical geography all the importance it merits. To him who knows how to observe facts, and deduce from them judicious conclusions, the structure of our globe is a book of much superior information and authenticity, with respect to the history of the revolutions it has undergone, than the traditions of ignorant savages, vague and destitute of authority

at the commencement, afterwards adopted by civilized nations, and formed into established systems."

After this external survey, the author proceeds, in the next place, to a *mineralogical* examination of the country. He inquires into the internal structure of the earth, and the constituent materials of its great strata. Having travelled considerably on foot, he made an extensive collection of the minerals. These he reduced to genera and species, and carried with him to Paris. There they form a kind of mineralogical cabinet of this part of North-America, in the museum of M. de la Metherie. In systematizing the facts on this part of the subject, Mr. V. nearly adopts the method detailed in the mineralogical survey of New-York, as published in Med. Rep. in 1798, Hex I. vol. i.; though that paper was prepared for the *Agricultural Society*, and not for an association of physicians, as Mr. V. states. The State of New-York was therein parcelled into five mineralogical districts: 1. The granite country; 2. The slate country; 3. The lime-stone country; 4. The sand-stone country; 5. The alluvial country. Mr. V. considers the continent of the United States also in a five-fold view; as composed, 1. Of a granite region; 2. Of a region of sandstone; 3. Of a calcareous region; 4. Of a region of sea-sand; and, 5. Of a region of river alluvions. By this arrangement he has divided that fifth section into two, and omitted entirely an account of the slate or shistus which is so abundant and characteristic of the soil in many places. For such an oversight we discover no sufficient reason or explanation. Still the details of Mr. V.'s narrative are generally judicious and sensible as far as they go. They are the fruits of long and laborious journeys. They show that he beheld with an observing eye the tracts over which he travelled. They satisfy the reader that he possesses a discriminating as well as a generalizing mind. Besides the facts which he has gathered and methodized, we observe various ingenious speculations on the beds of ancient lakes, which have long since disappeared.

But he is certainly mistaken in insisting that the Mohawk-River, at the Cohoes, falls over a rock of serpentine. He may rely upon it that the bed of the river at that spot is a shattered or fragile slate. And we now inform him that the Hudson, at the rapids of Fort-Miller, and the falls near Fort-Edward, descends over rocks of shistus. Even at Ballstown Springs the Kayaderossas runs over strata of slate. Surely, then, a continuation of shistus from the Highlands to Fort-Edward, a distance of one hundred and forty miles, was worthy the notice

of such a minute observer, especially since he describes shistus as forming strata at Lake Miamis, Niagara, and all along the St. Lawrence to Quebec.

He is also mistaken in his assertion that granite " is the nucleus of Long-Island, around which sands have been heaped and worn by the sea." (p. 47.) That island has no rocky nucleus of any kind. It contains no stratified granites, except for a small space about Hell-gate. The rest are detached nodules, and some of them of enormous size. A ridge of hills runs from E. N. E. to W. S. W. almost its whole length. But these are composed of sandy, gravelly, and loamy earth, with loose stones and rocks. On their south side the land has every appearance of having been beaten up by the ocean; while, on the north side, the appearances are more mingled and ambiguous. For, while the tides and waves of the Sound are continually undermining the banks, and wasting the solid upland away, there are some other curious appearances leading to a belief that even this north side of the island has been anciently disposed by water. In a well dug to the depth of eighty feet, at North-Hempstead, in Queen's county, during the summer of 1804, the strata penetrated had plain appearances of being deposited by the ocean, and the materials of having been rolled by the waves. Every thing was rounded and water-worn, and had a near resemblance to the materials found on the shores, washed by the salt-water. The stratified materials were in the following thickness and order, to wit: of sandy loam, ten feet; compact clay, one; sand and gravel, nine; gravel and roundish stones, chiefly quartz and granite, breccias and argillaceous iron-ore of the size of paving-stones, ten: rocks of grey granite, jumbled together, five; gravel and roundish stones of the size and qualities mentioned before, three; hard loam, three; soft clay, six inches; sea-sand, roundish stones, and coarse gravel, variously mixed and alternately deposited, thirty-eight feet and six inches. For further particulars on the mineralogical constitution of Long-Island, we refer Mr. V. to the third volume of our first Hexade, p. 328.

His information was likewise incomplete relative to the prevalence of granite over the isthmus from Lake-George to Hudson's-River (p. 49). The mountains on the sides of that lake, as well as those about Ticonderoga, are composed of sandstone. And the whole valley where Fort-George is situated, some of the islands in the lake, and the region around the great falls of the Hudson, for several miles, are underlaid with lime-

stone. The Hudson and Mohawk, therefore, are not the boundaries of the granite, as Mr. V. seems to think (p. 51). For though *quartz* abounds in the Shawangunck Mountains, along the Wall-Kill, it is true there is no considerable mass of *granite* found on the "west" side of the Hudson, northward of Butter-Hill and Pollepell's-Island, where the chain of granite mountains from the N. E. crosses it, and is penetrated by it. Yet it is also true, that there is no granite toward the north, on the "east" side of the Hudson, within the limits of New-York State, except in that tract called the *Oblong*, bordering on the westernmost limit of Connecticut, and there dividing the waters which run into the Hudson from those which empty into Long-Island Sound. Along the eastern part of New-York and the western part of Massachusetts there is a stratum of calcareous rock reaching from Stockbridge quite to Vermont. (See p. 82 of this volume.) At Lebanon Springs the lime-stone rests upon a basis of shistus.

In defining the *Atlantic coast* Mr. V. might have been more precise. He should not have included the *whole* of Long-Island in this maritime alluvium. Notwithstanding the preceding remarks, the true point whence the region of sea-sand and water-worn pebbles ought to be reckoned is its longitudinal ridge of hills. The like might have been said of Staten-Island. The level and well-defined secondary strata begin from the southern foot of these hills. These elevations themselves, and all the land situated to the north of them, belongs to his third division, or mountain-tract. So, likewise, in tracing the ancient sea-coast along from the city of New-York, through New-Jersey, he might have beheld its extreme verge in the magnesian promontory of Hobocken, composed chiefly of telgstein and actinolite, with veins of asbestos. He could have viewed the termination of the abrupt ledge of trap and basaltes to the westward of that place and of Powles-Hook. Proceeding toward Newark, he could scarcely avoid seeing the large mass of rock called Snake-hill, standing to the north of the road, between the marshy and alluvial depositions of the rivers Hackinsack and Passaick. And he might have traced this primæval high-water mark to the hills lying in the rear of the village of Newark, thence continuing westward and southward to the right of Springfield, forming the (basaltic and trappy) barrier of the Scotch-Plains and Boundbrook, and crossing the waters of the Raritan six or eight miles above Brunswick. Thence it proceeds through Somerset and Hunterdon counties to the Delaware, a little north of Trenton;

and so on through the continent, as Mr. V. copying Evans, has described it.

Mr. V. affirms (p. 72) that the stratum or ridge of micaceous granite is the extreme limit of the tides in our rivers. The Hudson is a remarkable instance of the reverse. The tide proceeds in it beyond Albany, 170 miles higher than the layer of granite. There are some remarkable facts on this subject, which we offer to his consideration.

Rivers may be considered as outlets of the ocean. They are reservoirs, into which that body of water empties itself when swelled by the moon's attraction. The lifting of the water of the main ocean causes it to incroach upon the neighbouring land. And if the land is divided by rivers, it presses against their waters, and inverts their currents. The distance to which the streams are turned back toward their sources will be governed by the height of the lunar wave in the ocean, and the declivity of the river's bed. Where the inclined plane forming the bottom of the river is very near an horizontal line, the influx may reach very far inland. Where, on the other hand, the plane rises considerably, and approaches nearer the perpendicular, the flow of the tide will extend but a small distance up the channel. In ordinary circumstances, the moon is the governing power in all rivers as far as the tide extends. The current of the river itself has but a feeble and secondary action. For though this tends downward toward the ocean, its force is trifling in comparison of the great counter-agent which elevates and diffuses the water of the sea. This is exemplified by the facts, that the rivers possess most influence when great freshets rush into them from the mountains, and when the tides run neap in the neighbouring main ocean. That part of a water-course, therefore, which is situated between the ocean and the head of tide-water, is not, in strictness, any part of a river; it is rather an arm of the sea. It might be called the *æstuarium*, or space visited by tide-water. Thus, properly speaking, the Hudson terminates his course at Waterford, the Delaware at Trenton, and the Potowmack at Georgetown. The canal through which the water is pushed backward and forward by the tides, is neither river nor ocean, but the *æstuary* between the two, in which the current of the former is variously modified by the ebb and flow of the latter: it being understood that, except in neaps and freshets, the impulse of the ocean is the predominating power.

The actual and comparative times at which the Hudson and the Delaware swell by tides are nearly the following: At

Sandy-Hook and Cape-May forty-five minutes sooner than at New-York and Cape-Henlopen. At these two last-named places the time of high-water is the same. At Pollepell's-Island in the Hudson, and at some distance above Reedy-Island in the Delaware (perhaps Newcastle), it is high-water three hours later. At Esopus, on the former, and at Philadelphia, on the latter of these rivers, the time of high-water is almost four hours and an half later than at New-York and Cape-Henlopen. And the high-water point at Albany corresponds with that of Trenton, being upwards of six hours (some calculate six and an half) later than at the places just mentioned.

In the Hudson the impulse of the ocean is so powerful as to make the tide progress upwards at the rate of about twenty-five miles an hour. Hence a swift-sailing vessel, starting from New-York at young flood, with a fair and strong wind, may carry the flood-tide with her quite through to Albany. This, it is said, has been repeatedly performed. The vessel in this case going at the rate of perhaps fifteen miles an hour, will so far keep pace with the progress of the young flood as to make good her arrival before the tide, after high-water, shall run ebb.

A consequence of this superior oceanic influence is, that a vessel can sail into the river more rapidly than she can come out. Though this sounds like a paradox, it is nevertheless true. It is impossible for her to bring the current with her all the way outwards; for though the wind should be both brisk and favourable, she must necessarily meet the flood-tides, and stem their opposing forces. As she proceeds toward the great moving cause, the ocean, she meets its rising wave sooner and earlier, and then, if unable to stem it, must cast anchor and wait. And the nearer she approaches the sea, the more she anticipates the resisting power of the water, which it impels along the rivers, and whose undulation there constitutes the tide.

We are glad to find Mr. V. has collected so many facts on our mineralogy. And, that we may be aiding and assisting his researches, we offer him a few more. He may find them useful.

We are in possession of various specimens of minerals brought from the vicinity of the Ohio and Mississippi. Petrified marine shells and coralline substances are found on the west bank of the Mississippi, between St. Genevieve and St. Louis. These various animal exuviæ are connected by a calcareous cement.

From the vicinity of the great salt-works five miles below St. Genevieve, on the hills, and in the bottoms of the brooks which run from them, a very curious *silicious* stone, full of animal remains, has been brought. It strikes fire with steel, is of a whitish colour, and of a quality intermediate between quartz and flint. It is perforated with conical holes, some of which are empty, and others apparently filled up with the remains of some pelagian animal, probably the belemnites.

"The country up the Mississippi," as Mr. Ayres, who visited it, relates, "has probably been overflowed by the waters above being dammed up by the hills and mountains below; and this for a considerable length of time. The water being in part saturated with the lime and salt which are found there, would afford support and nourishment to testaceous animals similar to those of the ocean. The salt-licks are near great bodies of lime-stone. This would make one suppose the bottom of the ocean to abound with regular layers of lime-stone and salt-rocks: otherwise, how would shell-fish multiply in such numbers, if the water of the sea was not pretty well saturated with lime as well as salt?"

Calcareous incrustations and petrifactions, shells and different animal relicks, are likewise found in the neighbourhood of Cincinnati, in Mill-Creek. They have been discovered on digging wells between Cincinnati and Lexington; and in the bottoms of most of the creeks running through that country for twenty or thirty miles on each side. But we have specimens of a silicious stone abounding in the hills of the Missouri as far down as St. Genevieve, which is reported to be used by the inhabitants for gun-flints. And a rough pebble, possessing somewhat of the properties of jaspar and onyx, was picked up on the west bank of the Mississippi, between Cape-Jeridotte and St. Genevieve. The specimens we have examined from the tops of the Catskill Mountains in New-York, of the Blue-Ridge in New-Jersey, and the Alleghanies in Pennsylvania, are all sand-stones of the silicious kind. The constituent parts are of different sizes, from fine sand to coarse gravel and stones, compacted together. The colours also vary.

The specimen in our hands of the earthy deposition from the Mississippi, after the muddy water of the Missouri is united with it, is a kind of dove-coloured or ash-coloured clay, mingled with so much carbonate of lime as to effervesce briskly with the sulphuric, muriatic, and nitric acids. It is tolerably free from grit; is unctuous to the touch; has an earthy smell; crumbles and falls to pieces in water; contains spots of brown

oxyd of iron; and seems to be blended with the carbon of decayed animals and vegetables. This *terre-grasse*, or marl, as Mr. Dunbar calls it, is said to prevail on the low banks of alluvial ground, from the mouth of the Missouri to that of the Mississippi. The calcareous and carbonic ingredients tend to sweeten the water and fertilize the land. But we forbear further addition or criticism.

Notwithstanding the descriptions given of the cataract of Niagara, by Mr. Weld, Mr. Liancourt, and others, Mr. V. has likewise ventured to describe it. His account, which is circumstantial and scientific, is accompanied by a map of the country and Falls. After this he mentions the Falls of Montmorenci, of the Mohawk, of the Potowmack, of James-River, and of the Passaick, and thus concludes:

"Europe affords nothing that can be compared with these grand phenomena of nature, except the cataract of Terni, in Italy, and that of Lauffen, below Schafhausen, where, according to Mr. Coxe, the Rhine throws itself down seventy or eighty feet. This gentleman observes, that the sheet of water is broken by large masses of rock, which is a motive, in addition to its height, for comparing it with the Fall of the Potowmack. As to the cascade of Terni, it is the highest of all, since it is near seven hundred and fifty feet, but the body of water is not very considerable. The other cascades of the Alps and Pyrenees do not deserve mentioning after such grand objects; and now we are accurately acquainted with the cataracts of the Nile, once so vaunted, and know them to be in reality nothing more than rapids, falling, when the river is low, from four inches to twelve at each shelf of granite, we have a fresh proof of the exaggerating spirit of the Greeks, and their slight acquaintance with geography and natural history."

Mr. V. next treats of the earthquakes and volcanoes of the United States, and cites Dr. Williams's respectable memoir on the former of these phenomena as they have appeared in New-England. From 1628, when the first settlers arrived, to 1782, a period of 154 years, there are authentic notices of forty-five earthquakes. It is remarkable, he says, that none of these are felt in the western country beyond the Alleghany Mountains. But he seems not to have heard of the one in Kaskaskias in 1795. He says they all affect the direction of Lake Ontario as their central point. And to their concussions are to be ascribed many derangements and irregularities in the strata of the Atlantic coast. Mr. V. supposes these convulsions of the

globe are co-extensive with the deep foundation of *shistus* which underlays the sand-stone, lime-stone, and probably the granite; and thus constitutes the vast platform upon which the plains are spread and the mountains erected. The bituminous and sulphureous qualities of this shistus, he conceives, may render it inflammable and active enough to shake every thing that lies above it. He thinks this material particularly abundant round Lake Ontario and under Lake Erie. Hence that region is the focus of our earthquakes. Mr. V. conjectures that Ontario, from the deepness of its water, and the volcanic productions found on its borders, is the crater of an extinguished volcano, now filled up with water. Burning mountains are so rare in these parts, that it is said the savages from the distant western regions have no words in their languages to express them. This, however, only shows the Indians to be bad observers, and their language to be very scanty? for the latest travellers assure us that a volcano exists far up the Missouri, and we know that pumice-stones have been found floating down it. He also thinks a complete geological inquiry would prove that North-America emerged from the ocean at a time greatly more recent than either South-America or the eastern hemisphere. But this appears to be as much a mistake as the denial of earthquakes and volcanoes in the western country.

We think it our duty to inform the FREDES that Mr. V. repeatedly mentions them by their old and provincial name of *Anglo-Americans*. When the people of this distinguished part of the western world shall determine to assume their proper appellation, it will be easily in their power to avoid the nicknames which foreigners bestow upon them.

We must reserve for a future number Mr. V.'s remarks on the climate, winds and diseases of the United States. But we inform our readers by anticipation, that he is a firm supporter of the local and domestic origin of yellow fever (p. 337), and that, in his opinion, notwithstanding the boasted cleanliness of New-York and Philadelphia, the docks and suburbs of these two cities exceed in public and private nastiness every thing that he ever beheld in Turkey (p. 347); with this difference against us, that the oriental atmosphere possesses a much more healthy dryness than ours.

(To be continued.)

ART V. *Collections for an Essay towards a Materia Medica of the United States. By* Benjamin Smith Barton, *M. D. Professor of Materia Medica, Natural History, and Botany, in the University of Pennsylvania. Part second.* 8vo. pp. 53. *Philadelphia.* A. & G. Way. 1804.

IN our second volume of the first Hexade, p. 70, we presented a review of the first edition of the first part of these Collections. In vol. v. of the same Hexade, p. 436, we also gave an account of a second edition of that part, improved by the addition of a number of notes, and by a considerable enlargement of the Appendix. We now engage in the pleasing duty of laying before our readers a sketch of the second part of the work, which had been an object of public expectation from the time of the publication of the first.

It affords us much pleasure to see the zeal and diligence with which the learned Professor continues to pursue this interesting subject. He appears to be duly sensible of the inexhaustible treasures which the Materia Medica is likely to derive from the regions of America, and he is sanguine in his expectations of the future, when he recollects that the new continent already boasts of " the different species of Cinchona, the Quassia, the Simarouba, the Guiacum, the different kinds of Jalap and of Ipecacuanha, the Polygala Senega, the two species of Spigelia, not to mention many other valuable medicines," among its indigenous productions; and this boast is enhanced by the consideration that a large proportion of them have not yet been found in the other quarters of the globe.

Of the great importance of the investigations which are pursued in this work, it would be superfluous to say much. They are adapted to advance the progress of medical science, in which all mankind are deeply interested; and they are particularly calculated to develope the properties of the native productions of this country, and thereby to improve its resources, wealth and independence. It is difficult sufficiently to appreciate the value and consequences of the first attempts in such an undertaking as this; for not only the extent and fertility of the subject are a security from disappointment, but one enterprising labourer cannot fail to incite a multitude of others to follow his example and share his success. How much this has been verified in the case now before us, is well known to the public. Excited by the researches of Professor Barton, many of his pupils have been induced to engage in inquiries con-

cerning the vegetables mentioned in his *Collections*, which have terminated in the acquisition of a large body of important facts. And such has been the spring thereby given to inquiries of this kind in our country, that we shall not be too sanguine in looking forward with confidence to very interesting discoveries.

After all that has been said of the immense load of useless articles which oppress our catalogues of the Materia Medica (and a prodigious number might certainly be expunged with advantage), there is still a want of remedies, active, potent and durable, which cannot be sufficiently lamented. And the ground of this complaint will never be completely removed while human nature continues to be afflicted with a single incurable disease.

In this second part of his *Collections*, the author pursues nearly the same plan of arrangement which he adopted in the first.

Under the head of ASTRINGENTS, he treats of *Geranium maculatum*, *Heuchera Americana*, *Pyrola umbellata*, *Myrica cerifera*, *Prinos verticillatus*, and *Orobanche Virginiana*.

Among TONICS, he treats of the *Zanthoriza apiifolia*, *Hydrastis Canadensis*, *Gentiana centaurium*, *Chironia angularis*, *Frasera Caroliniensis*, *Cornus florida and sericea*, *Magnolia glauca*, *Prunus Virginiana*, and *Eupatorium perfoliatum*.

We think it proper to quote the following account of the use of the *Cornus florida and sericea* in the words of the author:

"I can add but little, from my own experience, concerning the application of these two species of Cornus to the cure of diseases. I believe, however, that it may, with entire safety, be asserted, that, as yet, we have not discovered, within the limits of the United States, any vegetables which have been found so effectually to answer the purpose of the Peruvian bark, in the management of intermittent fevers, as the Cornus florida and Cornus sericea.

"In an intermittent fever which prevailed in West New-Jersey about twenty-four years ago, the bark of the Cornus florida was found more useful than the Peruvian bark. It was used in the shape of a decoction.* I must candidly confess, however, that I have heard of more instances of the failure

* "From the information of my learned friend, the Rev. Dr. Nicholas Collin, of Philadelphia."

of this Cornus than of the Peruvian bark. But has any vegetable so completely prevented the recurrence of the paroxysms of intermittents as the last-mentioned one? In the mineral kingdom, indeed, we have discovered an inestimable substitute for the bark: I mean Arsenic. This, particularly, I think, when it is given in substance,* will more certainly cure the intermittent than any vegetable yet known, the Peruvian bark excepted. But I am inclined to think that relapses are more common after the employment of arsenic than after that of the bark. *Besides, arsenic cannot always be used with entire safety.* In illustration of this position, I may here observe, that I myself have seen three cases of very general œdema of the face and limbs (especially the former) evidently induced by arsenic. Two of the subjects were children, and the third an adult. They all recovered, without experiencing any other inconvenience from the medicine. I have also seen a case of *temporary* paralysis (or, perhaps, rather extreme debility) of the limbs induced by the medicine, in a patient labouring under an obstinate intermittent. These notices may, possibly, be of some use to the very young and inexperienced practitioner, for whom principally they are thus candidly mentioned.

"The spirituous tincture of the bark of the Cornus sericea, already mentioned, has been advantageously used in the latter stage of diarrhœa, unaccompanied with fever."†

The author's account of the *Eupatorium perfoliatum* presents an interesting view of the virtues of that popular and domestic remedy.

* "I have, for several years, employed the oxyd of arsenic in substance, in preference to Dr. Fowler's solution. I think it a much more certain medicine than the solution. I commonly give it in combination with opium. One grain of the arsenic is united to four or eight grains of opium, and made into a mass with conserve of roses, or honey, or soap. This is divided into sixteen pills, of which I direct the patient (an adult) to take two or three, at different periods, in the course of the day and night, *especially during the apyrexia.* Such are the powers of this medicine, that two grains of it are often sufficient to cure an intermittent that has continued for weeks! Sometimes I use larger doses; but, in a majority of the cases that have come under my notice, I have found three-sixteenths of a grain of arsenic sufficient for the period of twenty-four hours. As children are, with difficulty, prevailed upon to take the medicine in the shape of a pill, I rub down the arsenic with honey or molasses and water, and sometimes with a portion of gum-arabic. In this form it is very conveniently given to children by drops; and the quantity of the mineral in each dose may be estimated with considerable accuracy. In the cure of intermittents, does arsenic operate by virtue of its tonic power? The Peruvian bark sometimes cures intermittents that have resisted the powers of arsenic."

† "From the information of Dr. Amos Gregg, jun."

The section of STIMULANTS or INCITANTS is subdivided into *general* and *topical.*

Among *general stimulants* are noticed the *Kalmia latifolia, Laurus sassafras, Phytolacca decandra, Arum triphyllum, Clematis crispa,* and *Clematis viorna.*—Of the *topical stimulants,* the author presents observations on the *Pyrola umbellata, Rhus radicans, Kalmia latifolia, Nerium oleander, and Rhus glabrum.*

The account given of the effects of the *Rhus radicans* on the author himself deserves to be quoted in his own words:

"The following observations relative to the deleterious property of this common plant will not, I hope, be unacceptable to those who are interested in a knowledge of its natural history. The person who is the subject of the observations has for many years been severely affected by the plant; and although many other persons are similarly affected, it is not often, I believe, that the progress of the poison is marked with minute attention in those who are injured by it.

"On the eighth day of July, 1795, I applied two or three drops of the milky juice, while it issued from the common foot-stalk of the leaves of the Rhus radicans, to the wristband of my shirt. These leaves, immediately before, had been torn from the stalk of the plant by a friend of mine.* My object, in applying the juice, was to determine in what length of time it would assume the black hue. In a few minutes I found that the linen was stained black, and in a short time after this I observed that the juice had penetrated through the wristband, and that it had communicated a dark brown or blackish colour to that portion of the epidermis which was immediately under it. The day was unusually warm, and I went into the water to bathe. In the evening I felt a considerable itching of my wrist, and the following morning observed that there were upon it a number of extremely minute vesicles, which contained a fluid more or less limpid or transparent. The itching increased hourly: the wrist and the middle of the fore-arm began to swell, and the vesicles extended themselves rapidly, chiefly upwards, towards the elbow, and partly downwards, along the lower part of the wrist, and upon the fingers.

"Meanwhile, vesicles, accompanied with, and preceded by, itching more or less troublesome, made their appearance upon

* "I was not myself within the sphere of the action of the plant, which I was careful to avoid, well knowing, from long experience, its injurious effects upon me."

various other parts of the body. The face was universally sprinkled with them. But these were extremely small; the fluid which they contained was always very limpid; and, without any application except that of cold water every morning, they entirely disappeared in two or three days.

"About the seventh or eighth day, the itching, the inflammation, and the spread of the vesicles, appeared to be nearly at their height. At this period, and for some days afterwards, the greater part of the fore-arm, and about one-third of the arm, were swelled to nearly twice the natural thickness; the itching was intolerable, and the vesicles, in general, were no longer filled with a limpid fluid, but contained a thick matter, or pus, very similar to that of small-pox, and strongly adhering to the linen.

"On the ninth day I perceived a swelling in the axillary gland of the right arm, which was that to which the lacteous juice was applied, and which was chiefly affected. The swelling rapidly increased, until it became of the size of a hen's egg, and on the second day from its appearance it had almost entirely vanished.

"From the period that the swelling was at its height, to its entire disappearance, the itching was almost universal, and much more insupportable than it was before. I attributed this itching to the influence of the poison, which, I suppose, was conveyed into the system from the time that the axillary gland began to swell and inflame. Nevertheless, I could not discover that there was, in consequence of this supposed absorption of the poison, any increase of the number of vesicles upon the surface of the body.

"In fifteen days from the time that the poison was first applied to my arm, all the disagreeable symptoms had ceased; the vesicles had almost entirely disappeared; a desquamation of the affected parts had taken place, and a new epidermis had been formed.

"From the foregoing statement it must appear evident, that to some constitutions the milk-like juice of the Rhus radicans is capable of producing very disagreeable effects. It must not, however, be imagined that these effects are equally disagreeable to all constitutions; and it is certain that there are *many* persons who are not at all affected by this plant.

"It has been asserted, that persons of the most irritable habits of body are the most liable to be affected by the Rhus radicans, and by some other species of the same genus. I do not intend to oppose myself as an exception to this position;

but from a recollection of the constitutions of several persons to whom this poison has been applied, I have very little hesitation in asserting, that the susceptibility of receiving its influence is by no means proportional to the degree of irritability, whether muscular or mental, of the habit. It may, I believe, be asserted, with much more truth, that the susceptibility of receiving the influence of the poison of the Rhus radicans is somewhat proportional to the delicacy and thinness of the epidermis and skin. Hence, no doubt, it is that females are more liable to be poisoned by this plant than males; that the face is seldom so much affected by it as the arms, the genitals, and most other parts of the body that are protected from the constant influence of the air; and that young persons are more frequently poisoned than those who have arrived at the age of manhood, or who have passed to the term of older age.

"I have said that there are many persons who are not in the least affected by the poison of the Rhus radicans, externally applied. This is an undoubted fact. Some of these persons, after expressing the juice of the plant, will rub it upon their arms, and other parts of their bodies, without experiencing the smallest injurious effect. I am acquainted with two gentlemen who find no ill effects from chewing, for a considerable time, the recent leaves of this plant. It deserves to be mentioned, that one of the gentlemen I allude to is liable to be considerably injured by the effluvia of the Rhus radicans, when applied to the external surface of his body."

Under the fourth head of SIALAGOGA, Dr. B. treats of *Polygala senega*, *Zanthoxylum Clava Herculis*, and *Zanthoxylum fraxinifolium*.

Under the section of EMETICS, he treats of *Spiræa trifoliata*, and *Sanguinaria canadensis*.

Among CATHARTICS, he offers observations on *Asclepias decumbens*, and *Juglans cinerea*.

In the section of DIURETICS, he mentions the powerful operation of *Erigeron Philadelphicum*, and of a species of *Menispermum*.

The head of ANTILITHICS includes an account of the *Uva ursi*, *Pyrola umbellata*, *Corylus Americana*, *Erigeron Philadelphicum*, and *Convolvulus panduratus*.

Under the last head of ANTHELMINTICS, Dr. B. treats of the *Prunus Virginiana*, *Veratrum luteum*, *Laurus benzoin*, *Sanguinaria canadensis*, *Diospyros Virginiana*, and *Melia azedarach*.

In the section of Anthelmintics we think the Professor is

disposed to ascribe more importance to worms, in the diseases of the summer and autumn, than correct observation will be found to justify. He calls such epidemics *verminose* (p. 51), and, if we rightly understand him, supposes worms to possess some degree of agency in constituting the cause of the diseases in question. This appears to us in a very different point of view. We consider the frequent discharge of worms in such epidemics merely as an effect, and not as a cause; as the result of the febrile heat, of the commotion, and, perhaps, other morbid conditions of the intestines, which then no longer furnish to the worms a comfortable lodgment. Such diseases, indeed, seem to be themselves, in effect, powerful *Anthelmintics*, and to do much more in expelling worms than the worms can possibly do in producing or constituting the disease. The noxiousness of *worms*, like *nervous* and *gouty* diseases, seems to be often resorted to for the purpose of explaining what is not well understood. But the evil does not terminate in the abuse of words. The popular misapprehension on this subject leads to very injurious, and sometimes destructive modes of treating the complaints of children. In a great variety of their diseases, and frequently where worms are quite unconcerned, we see families every day using very violent Anthelmintics, particularly the patent medicines which now so universally circulate. There is reason to believe that the constitutions of delicate children are often irretrievably ruined by this mistake. We should be glad to see more discrimination in the treatment of what are called *worm-cases*, which we are confident would lead to more reserve in the use of Anthelmintics, especially of such as produce a drastic operation.

From the manner in which the two Parts of this publication have successively appeared, and from the favourable reception they have met, we cannot but hope that the Professor will proceed in the accumulation of his *Collections*, and occasionally, as his leisure may permit, lay them before the public. And we trust the day is not far distant, when he will find his masss of materials so large and important as to induce him to digest the whole into a methodical and systematic work.

ART. VI. *The Domestic Encyclopædia; or a Dictionary of Facts and useful Knowledge: comprehending a concise View of the latest Discoveries, Inventions, and Improvements; chiefly applicable to Rural and Domestic Economy: together with Descriptions of the most interesting Objects of Nature and Art; the History of Men and Animals, in a State of Health or Disease; and Practical Hints respecting the Arts and Manufactures, both Familiar and Commercial. Illustrated with numerous Engravings and Cuts. In five Volumes. By* A. F. M. Willich, *M. D. Author of the Lectures on Diet and Regimen, &c. &c. First American Edition, with Additions applicable to the present Situation of the United States. By* James Mease, *M. D. and Fellow of the American Philosophical Society.* 8vo. *Vol.* i. pp. 506. *Philadelphia.* Birch & Small. *New-York.* T. & J. Swords. 1803.

THE nature and objects of this work are so fully set forth in the title, that it is scarcely necessary to go into a more particular description. In a performance of such variety and extent, it might be naturally expected that some subjects would be treated with more discernment and ability than others, and that the alphabetical series would often betray the author into a mixture of trivial and common-place matter with his more important discussions. As the work, from the nature of it, is chiefly made up by compilation, much of its merit and usefulness must depend on the skill of selection, and on the suitableness of its materials to the condition and state of society of the nation or community for whose benefit it is intended. It was written in England, by a German physician of eminence, who previously had become favourably known to the public by several respectable publications. That he should now and then introduce matter more likely to meet a good reception in his native country than among the people of Great-Britain and the United States, is by no means strange. Some things of this kind will perhaps be occasionally found by such as are disposed rigidly to scrutinize the value of every article. At the same time it cannot be denied that Dr. Willich has embodied in this work a very large collection of facts, precepts and observations, especially such as are applicable to rural and domestic economy, which cannot fail to diffuse much important knowledge, and to improve those arts which are of the most universal concern.

For this American edition of the work, the public are indebted to Dr. Mease, of Philadelphia. It does honour to the learning and diligence of this gentleman, that he has employed so much research, and found access to so many sources of information, in order to supply the deficiencies in the British edition, and to accommodate the whole to the present stage of national progress, and the present state of the arts and of society in the United States. With a very judicious discrimination, he has pruned away many things which must be considered as less applicable to the condition of our country, and he has supplied their place with substitutes and additions, which will be gladly received by all who feel a proper concern for individual or public welfare. We know no class of citizens, wherever situated, or however employed, who may not derive much useful information from this work in its present improved and extended form. We cannot give a more distinct view of what has been done by Dr. Mease towards the amendment of the work, than his own account of this, as stated in the *Preface by the editor*, which we present in his own words.

"In presenting to the public the first American edition of the *Domestic Encyclopædia*, the editor has great pleasure in thinking, that it will diffuse a large portion of highly useful information among his fellow-citizens. In the impressive language of Lord Bacon, the subjects treated of in the work 'come home to every man's business and bosom;' and it will, no doubt, meet with a reception justly proportioned to its extensive utility.

"The original work contained a variety of articles relating to the local customs, laws, police-regulations, mineral waters, &c. of England, from which the people of this country could derive no practical or useful information; all these have been omitted in the present edition, and other matter substituted, which, it is hoped, will be found nearly connected with the interests or domestic comforts of the citizens of the United States.

"Consistently with the original design of the author, the editor, endeavouring to keep in view the *practical* tendency of the work, has avoided all theoretical discussions, except when they appeared necessary to place facts in such a light as would tend to point out relations and connections that might otherwise have escaped notice; and thus, as Dr. Anderson justly observes, 'by forming habits of attention, call forth the dis-

criminative powers, on the due exercise of which all true knowledge must ultimately depend.'

" It has been a principal object to direct the attention of the reader to the native resources of our country, whether they refer to medicine, the arts, or to the general purposes of life; that, by employing them, we may become less dependent on foreign nations.

" In one respect the original arrangement of the author has been partially departed from. Dr. Willich treats of plants under their trivial names, referring to the botanical names; and as whim or false judgment gave rise to the former, which are not only various in different countries, but in different parts of the same country, it was thought better, in all the additional articles, to give the *Latin* name first, referring to the numerous trivial ones. If this plan were generally adopted, an universal language might soon take place, and much confusion and embarrassment be avoided. The common objection to this plan, that it is difficult for those who are unacquainted with the Latin language to remember the names imposed by botanists, will be found unimportant, when we advert to the ease with which many of those names are remembered by persons who are entirely ignorant of the language. Thus *Anemone, Ranunculus, Convolvulus, Daphne Indicum*, &c. are common, and others surely may be remembered with as much ease as the absurd trivial names which are at present used. The ' Sweet flag' of England is universally known in Pennsylvania by its proper name, *Calamus:* indeed, it only requires a little trouble, by learning the botanical names at first, to render them as familiar as the common appellations."

Our present examination only includes the first volume of the work. We shall hereafter proceed to review the subsequent volumes in order.

MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

EDITIONS OF THE LATIN CLASSICS IN NEW-YORK AND PHILADELPHIA.

DOCTOR (Sir William) Blackstone, in his celebrated Discourse, read in Oxford, at the opening of the Vinerian Lectures in 1758, and prefixed to his *Commentaries on the Laws of England*, mentions the gentlemen of the profession of physic as remarkably deserving, beyond others, the character of general and extensive knowledge. This is owing, in no small degree, to their high and distinguished attainments in polite learning. We therefore consider the medical profession as interested in the promotion and progress of classical literature in our country. And we judge that beneficial consequences will result to this faculty from the augmented number of colleges and students, and from the growing demand for Latin books. Perhaps there is no art in which greater excellence is already attained among us than in that of printing. And, of late, valuable editions of several of the Roman classics have been offered to the public. In New-York, the literary talents of Mr. Malcolm Campbell have been very laudably employed in enabling the booksellers to give accurate editions of the Commentaries of Cæsar, the Bucolics, Georgics, and Æneid of Virgil, and the Orations of Cicero. His edition of Cæsar's Commentaries was published in 1802, in 12mo. for schools, and dedicated to Professor Wilson, of Columbia College. It consisted of 1500 copies, which are mostly sold off. His edition of Davidson's Virgil came out in 1803, in two volumes large 8vo. and is a complete and handsome work. His edition of Merouille's (or, as it is called, the Dauphin's) Select Orations of Cicero, made its appearance late in 1804. It was undertaken by Mr. T. S. Arden, and is a very fine performance, both for correctness of text and beauty of execution.—In Philadelphia, the Classical Press of W. Poyntell & Co. has already afforded several of the Roman works in an excellent style. During the present year, Ruæus's

Virgil, Godvinus's Cæsar, and Crispinus's Sallust (the Dauphin editions), have made their appearance. They are in the ample octavo form, and follow, errors excepted, the London copy. The publishers assure the principals, professors, and teachers, in our seminaries of learning, that a complete edition of all the Greek and Latin classics will speedily issue from their press.

We subjoin on this subject an observation of the celebrated Johnson, in his Life of Dr. (Sir Samuel) Garth: "Whether what Temple says be true, *that physicians have had more learning than the other faculties*, I will not stay to inquire; but I believe every man has found in physicians great liberality and dignity of sentiment, very prompt effusion of beneficence, and willingness to exert a lucrative art where there is no hope of lucre."

CANVASS-BACK DUCK AND ITS FOOD.

Extract of a Letter from Mr. C. S. Rafinesque to Dr. Mitchill, dated Philadelphia, Sept. 7, 1804.

"Having seen in the Medical Repository the mention made of the canvass-back duck and its food (Hex. I. vol. v. p. 342), I have paid particular attention to ascertain what both were; and it is with some degree of pleasure I am able to tell you that I have been successful enough to find their true scientific names. The first is certainly the *anas ferina* of the ornithologists, *le milvuin* of Buffon and the French authors, which is found in Europe, Asia and America. I have seen it myself in Italy and France, where it is reckoned a good game, but not so dainty as it is thought here. I have examined four of them in Philadelphia, which came from the neighbourhood of Havre de Grace, where they are still plentiful in winter. When there, I was shown the plant or grass they feed upon, and found it to be the *Valisneria Americana*, a new species, somewhat different from the *Valisneria spiralis* of Europe. It covers the bottom of the shallow parts of the Susquehannah, and the head of the bay, from which its leaves nearly reach the surface of the water. The root shoots, in the fall, fleshy and almost esculent buds or protuberances, which stand during the winter, and are the chief food of the *anas ferina* in those parts. Those that escape them send forth next spring new leaves, and sometimes stems also.—The Valisneria Americana is called channel-weed in the river Delaware, and canvass-back-duck-food in the Susquehannah.

MEDICAL SOCIETY OF GEORGIA.

It must be gratifying to those who have witnessed the progress of medical science in the United States, to be informed that the medical characters of Savannah have associated themselves under the title of the "Georgia Medical Society." It was organized on the 28th of June, when the following officers were elected for one year.

Dr. NOBLE W. JONES, President.
Dr. JOHN IRVINE, Vice-President.
Dr. LEMUEL KOLLOCK, Treasurer.
Dr. JOHN GRIMES, Secretary.

Dr. Kollock was nominated to deliver an oration the next anniversary.

CABINET OF FRENCH MINERALS AT CAMBRIDGE (MAS.)

In the year 1794, Charles Theodore Mozard, then French Consul at Boston, presented to the University of Cambridge, in the name and behalf of his government, a complete collection and assortment of the minerals which had been discovered *in France.* And he was instructed to solicit a correspondence between that college and the agency of mines at Paris. These specimens make a distinguished appearance among the objects of natural history belonging to the museum of that ancient and respectable seminary. A similar collection of the minerals of Fredon would be very highly prized in France, and be eminently useful at home.

ABSORPTION OF SEA-SALT BY A PEACH-TREE, SO AS TO BE TASTED IN ITS FRUIT.

Extract of a Letter from Dr. Malachi Foot to Dr. Mitchill, dated Sept. 2, 1804.

"I present you, by the bearer, with a *peach.* You will readily perceive that I could not be induced to this from any thing very promising in its aspect, the richness of its flavour, or the singularity of its species. On tasting, you will find it highly charged with *muriate of soda:* and when I inform you that it has undergone no artificial management, but possessed this property when plucked from the tree, you may find some difficulty in explaining the fact.

"This peach was presented to me yesterday by Mr. Solomon Brewer, of Greenburg (Westchester county), my former residence. Mr. Brewer is a respectable man, and the present clerk of the town in which he lives. The history he gives me of this natural *salt-peach* is, that it grew in his neighbour-

hood, on a tree around the body and roots of which had been accidentally poured a quantity of pork or beef brine; that its species ripens some time in the present month; that the effect of the brine had been to produce a sickness and decay in the tree; and that, at this time, it presents the singular fact of a tree hanging tolerably full of *salt-peaches*. He was unable to inform me of the precise time of the occurrence, but that it was the fore part of summer, and after the fruit had obtained its shape and some size.

"This fact, as respects the vegetable kingdom, is in my mind an isolated one. The Abbe Molina, in his history of Chili, mentions a plant, the *Ocimum salinum*, which, though it grows on the Andes, sixty miles from the sea-coast, is every morning covered with saline globules, and that each plant affords, every twenty-four hours, about an ounce of salt, which the peasants collect, and esteem as being superior in flavour to common salt. Dr. Darwin, who mentions this fact (vide Botanic Garden, Part ii. p. 112), seems, by the following lines, to have adopted the opinion that this plant, notwithstanding its distance from the sea, possesses some singular power of attaching to its outer surface a portion of the salt suspended in the atmosphere.

> "Emerg'd from ocean springs the vaporous air,
> Bathes her light limbs, uncurls her amber hair,
> Incrusts her beamy form with films saline,
> And Beauty blazes through the crystal shrine.
> So with pellucid studs the ice-flower gems
> Her rimy foliage, and her candied stems."

The more probable opinion is, that this is effected by a different, though not less singular property in this plant; viz. that of compounding by synthesis in its vessels *pure muriate of soda*; analogous to the secretory organs of the liver in affording soda, and that in animals who had not tasted a particle of common salt.

"But the present case is not a similar one, and by it we are presented with a fact which goes still further towards illustrating that close analogy which obtains between vegetables and animals; it being long known that the lacteals and absorbents of the latter possess the power of taking in, in an undecompounded state, various articles of diet and medicine, as in eating onions, asparagus, cabbage—and in swallowing madder, sulphur, mercury, &c.

"I have felt the more interest in noticing this fact, as it contributes much to strengthen and confirm the opinion you long

since advanced, that certain vegetables, as wheat, partake much of the properties of the manure which is used as their aliment, and thence urge, with much propriety, the importance of the subject to agriculturists.

"Dr. Darwin advances the opinion that both the acids and acidifiable bases of saline substances generally, and particularly the muriate of soda (not to say, according to modern geological theorists, the whole superior and incumbent strata of the earth), are the production of animal and vegetable organization; and that the originally brineless ocean is receiving a perpetual accession of saline strength from their macerating recrements.

"This subject will probably be illustrated by a better acquaintance with animal and vegetable physiology, and with that interesting subject, the composition of bodies, about which modern chemistry is so confident, and on which you have some doubts."

CLEARNESS OF THE NORTH-AMERICAN ATMOSPHERE.

While Dr. Priestley was engaged, during the month of July, 1801, in making experiments with a double convex lens upon some metallic substances at Northumberland, in Pennsylvania, he wrote thus to Dr. Mitchill:—"If I have a few days more sunshine I shall finish what I am about, and write the next post. Happily we are never long without sunshine; whereas, in England, I have often waited months, and the days in which I could use a burning lens have not, I am confident, exceeded one fortnight in some whole years, and I have often watched every gleam the year through. I think the climate of this country greatly preferable to that of England," &c.

RAW OR UNCOOKED VEGETABLES BEST FOR THE SCURVY.

It is ascertained by experiment, in our New-York ships which go to the southern hemisphere on whaling voyages of twenty months duration and more, that scorbutic symptoms appear among the crews, unless they have temporary supplies of fresh vegetable matter. This happens when the vessel is untainted, when the water is plentiful and good, and the beef and pork well-salted and sweet. The mode of prevention is perfectly understood. Fresh vegetables can accomplish that object, and even work a cure. But it has appeared to the satisfaction of these voyagers, that if the fruits and roots which

they procure are consumed raw, they do greatly more good than if they are boiled. And this difference is so considerable, that their salutary operation is much abated, if not in a great degree spoiled, by cooking. Under a conviction of this truth, for example, they cut their pumpkins into slices, and deal them out to the men in their raw state, rather than stew them. In like manner, if a supply of potatoes is procured, the best way of dealing them out to the messes, and of consuming, is in their natural and crude state. They lose a principal part of their antiscorbutic virtue by being boiled. They who have been at sea upon such voyages, describe, in strong terms, the greediness with which they devoured raw pumpkins and potatoes, and of the benefit they derived from them as antiscorbutics.

This difference of efficacy in cooked and uncooked vegetables is a practical point of no small importance; and furnishes something upon which our physiologists may exercise their speculative talents.

Remarks on an Essay upon the Salt-trade between the United States and Great-Britain, occasioned by a Pamphlet published in Liverpool, 1804, *on the Manufacture and Quality of Cheshire Salt, and industriously distributed through the American Sea-ports.*

The view of the salt-trade which was given in our second Hexade, vol. i. p. 83—86, has been the subject of an ample commentary by a writer in the London Monthly Magazine of January. Our readers will recollect that almost two-fifths of our imported salt is brought from England, and is of English manufacture. It was there stated that our beef, pork, and other animal provisions, were remarkably prone to become tainted and corrupt by being packed with it. And a strong dissuasive exhortation was given to our fellow-citizens against employing it for the preservation of meat intended to be kept through our hot summers, or sent to warmer climates.

In this there was a desire to exhibit facts, and warn our people to beware of a foreign evil. In rejecting a salt which disposed our flesh-meats to spoil, our ships and cities to be infected, and our people to be destroyed, our fellow-citizens would at once save their property and their lives.

It was to be expected that a diminution of the demand for this salt, which chiefly comes to us from the Liverpool market, would be a subject of sorrow to those who were interested in

the manufacture and sale of it. It might also be expected that the owners of vessels, who wanted it for ballasts or cargoes, would grieve at any event which lessened the profits of transporting it. But the private emolument of these persons is not to be put in competition with the character of our provision-trade, nor the health of our people.

This advocate for the excellence of English salt admits that the amount we stated to have been imported was within bounds; as also that the fine-grained salt is by no means so good for the *packing* of fish and provisions as the coarse-grained, because it does not preserve them equally well from putrefaction.

This is a concession of a large part of what was held out to our countrymen. The *fine salt* imported from Liverpool is allowed by its eulogist to be unfit for packing fish and other provisions, that is, beef, pork, and butter. And we will now proceed a step further, and assure him that large parcels of pork, which were packed in the autumn of 1803 with the *large-grained* or *fishery-salt* so highly commended for its antiseptic powers, have been condemned by the public inspectors as corrupt and bad, this very season, in the New-York market. By trusting to its preservative qualities, the country traders have sustained heavy losses. Many families have found their domestic stock of salt meat materially damaged in the same way.

Though we are well aware of the uncertainty of *à priori* science and analytical experiments, there is no disposition to find fault with those of Mr. Henry. But while we listen to his report of the effects of re-agents upon Liverpool salt, this writer ought, in complaisance, feelingly to consider the numerous and expensive experiments, and these upon a large scale too, made by our provision-merchants, and repeated for a series of years. They are really some of the most costly and ruinous experiments in chemistry which we are acquainted with. The sufferers have a right to complain of the salt which thus disappoints and distresses them. And unless it is offered to them in a better condition, they only act with common prudence in refusing to use it. Such conduct is merely a part of the system of self-defence.

In expressing a belief that the fault lay in the admixture of foreign substances with the muriate of soda, there was merely a repetition of the opinion of some of the most able chemists and experimenters of Britain. If, however, all these varieties of salt are so pure as is asserted, then the mystery of its weak-

ness and insufficiency to keep flesh from spoiling is greater than ever. While, therefore, the advocate for Cheshire salt philosophizes on its purity, he must allow the Americans to philosophize on their corrupted provisions. They will be much obliged to him, as he appears to possess a respectable degree of information, to explain to them the cause of its failure to answer the purpose, and likewise why all the salt produced along the American coast, *by force of fire and boiling*, during the revolutionary war, was quite unfit for keeping provisions in a sound and wholesome condition.

The writer affirms that, though large quantities of Cheshire salt are sent to different European states, to Africa, and to their American colonies, and used in their fisheries and navy, yet no pestilential disease has been produced in any case, in any of those places, by it. Now, this declaration appears to be miserably incorrect. All the books of practice written by the physicians and surgeons belonging to the service agree in stating, that the African settlements, the southern American colonies, the West-Indies and the slave-trade, the navy and the army, are the great destroyers of British subjects, and that the pestilential agents which are concerned in this work are, malignant, putrid and yellow fevers, dysenteries and fluxes. The fashion is, indeed, to ascribe all this to foreign climates, but a more reasonable way of accounting for it is from the quality and component parts of their meat-rations, particularly as modified by *their salt*. And partly to this it is owing that the British, on foreign expeditions, suffer more by these pestilential distempers than any nation in Europe.

The experiments quoted show that the brine from the springs in Northwich contains a considerable quantity of magnesia and lime in combination with acids; and if these earthy salts, by boiling in an heat of 226 degrees of Fahrenheit, are consolidated, or united into the same mass with the muriate of soda, they must have a tendency to deteriorate the salt. In the case of bay-salt, with Bergman's experiment on sea-water from the Canaries to elucidate it, the writer errs egregiously in supposing that it is more impure than Liverpool salt. Can any person suppose that the slow, natural and easy evaporation will combine so many heterogeneous and impure materials with common salt as a boiling heat will? Such an opinion is repugnant to all the experiments we know on the subject of crystallization.

It may, perhaps, be worth the while to reprint, from one of our periodical publications, the observations of an acute

and sensible writer, and a sketch of the debates on the salt-trade in the Imperial parliament.

" It is well known that, for the greater part of the last century, the best salted provisions were those of Ireland. The fatuity of the English government has, in a great measure, destroyed that trade, and transferred the demand to the American market. We now supply the West-India market to an immense extent; and not only the colonists, but the fleets of the rival powers, have been necessitated to derive their salt provisions from the American market.

" My attention was drawn to this subject by perusing an English newspaper of the present year, from which it appears that, *without foreign salt, Irish beef and pork would not be so good as they have been.* The Irish derived their salt for provisions principally from *Portugal.* By the shutting of the Portuguese ports against the British, the Irish trade in salt is likely to be further affected. I give you the debate, which contains some important facts on this subject:

' *British Parliament.*

' SALT.

' Gen. Gascoigne rose to move for leave to bring in a bill to equalize, by weight, the bushel, on all salt imported into Ireland. His reason for proposing such a measure was, the loss sustained by those *who exported salt to Ireland from Great-Britain,* and particularly from the place he had the honour to represent (Liverpool), in consequence of the inequality in the duty paid on foreign salt and British salt. By an act of Queen Anne, it was ordered, that the bushel of salt imported into Ireland from Britain should consist of 56lbs. weight. The bushel of foreign salt consisted of 84lbs. For every bushel of each kind a duty of two shillings was paid; for which it was evident that less duty was paid on the *foreign* than on the *British salt.* The consequence was, that during the last five years a diminution took place of the salt imported into Ireland from Britain, of about 882,000 pounds less than during the five preceding years. This circumstance did excite some degree of alarm in Lancashire, and that was his reason for bringing forward the present measure. Should his motion be agreed to, it was his intention to propose in the bill, that the bushel of British salt should consist of 84lbs. the same as the foreign, which, in causing a small diminution of duty, would operate as a great relief to the people of Ireland, particularly the poorer; and, indeed, he wished that, in the course of some

time, the salt-duties, which were always oppressive to the poor, might be taken off altogether. At present the duties affected the three principal articles of Irish manufacture; namely, the *linen-trade*, the *salting of meat*, and the *making of butter*. These would receive some degree of encouragement from the measure he was about to propose; which, although it might at first cause a defalcation in the revenue of about £13,000 a year, would soon make up for that deficiency, by preventing the practice of smuggling salt into Ireland, which was carried on to a great extent. He concluded with making his motion.

'Mr. Corry (an Irish member) said, the reason for the difference in the measure which the Hon. General complained of, arose out of the difference in the *quality of the two kinds of salt*. That which was imported from Great-Britain was *white salt;* the other, which came from Spain and Portugal, was what they called *bay salt;* and was not so *fine*, or of so *good a colour*, as that which came from Lancashire; but it was *stronger*, and the grain of it was larger than the British salt, and it was *not so easily dissolved*. On this account the use of it was *indispensable to the salters of provisions;* and perhaps it was owing, in some respect, to the use of that salt, the *provisions packed up in Ireland, for the use of our navies and armies, possessed a quality not belonging to those of other countries*, which was, that they were *always preserved in the hottest climates*. If the people of Ireland were not able to purchase this salt at a *cheaper rate than any other*, the provision-trade would be materially injured, and our navy and army would lose a great deal of their supplies. But the manufacturers of salt in *this* country had no great reason to complain; for although the exports to Ireland might have decreased, the exports generally to other places had increased; and the reason why less had been, during the last three years, exported to Ireland, was because the *provision-trade there had fallen off;* and, of course, the demand for salt, in general, became less. If the present motion was persisted in, he should be obliged to oppose it. The duties on salt in Ireland were already voted for the ensuing year; and he thought it would be better to drop the subject until the duties should be again proposed next year. Nothing could give him greater pleasure than to promote any plan which might diminish the duty on so necessary an article as salt; and, perhaps, at some more convenient opportunity, he should propose to reduce the bushel of bay salt to 56lbs. to make it equal to the bushel of

British salt; and reduce the duty on each from 2s. to 1s. 4d. At present he must oppose the motion, and would move the order of the day.

'Sir William Pulteney and Col. Bagwell approved of the motion of diminishing the duty on salt. After some observations from Mr. Lee, Col. Vereker, and Mr. Wickham, Gen. Gascoigne withdrew his motion, and the house passed to the order of the day.'

"From this debate much useful knowledge is to be derived, which those interested in the subject cannot fail to perceive."

EXTERNAL REMEDY FOR DROPSIES.

The following ointment has been recommended by Dr. C. C. Blachly, in a letter to Dr. Mitchill, dated Sept. 11, 1804, as a remedy found by experience of several physicians beneficial in dropsical affections:

"Cases in proof of its efficacy can readily be given if desired. The following is the receipt:—℞ Saponis, Aceti, et Spt. Vini, ana partes æquales. The whole body is to be rubbed with it at bed-time; the patient being placed on blankets before a good fire. The friction and application are to be continued as long as the patient can endure it; supporting him with some brandy or wine during its application and continuance. This remedy, joined to the other remedies of dropsies, cures generally in one, two, or three applications; the water disappearing by perspiration and sweat, sometimes immediately. Œdematous legs, bound up with the mixture plentifully rubbed on them, are quickly reduced to their natural size."

FIRST FRUITS OF THE BOYLSTONIAN PRIZE-MEDAL.

The generous donation of W. N. Boylston, Esq. to Harvard University, for improving medical science, was stated at large in our Hex. II. vol. i. p. 99. It must give pleasure to all liberal minds to learn, that already the trustees have employed this excellent fund to advantage. One of the queries proposed by them, in 1803, was, "What are the causes, nature, and cure of the autumnal diseases of infants, as prevailing in the New-England States?" To this an answer has been given, in a Dissertation written by Dr. James Mann, of Wrentham, in Massachusetts. This performance of the successful candidate has been lately published in Boston, in a pamphlet of upwards of fifty pages. We mention it with much respect, as containing a perspicuous history of the *cholera in-*

fantum and other autumnal diseases of children. The history, treatment, and prevention of those disorders of the alimentary canal, are discussed in such a manner as to do honour to the professional talents of the author. It is intended to make this prize-essay the subject of a distinct review in a future number. We shall, therefore, only give an idea of its contents in very general terms at present. Dr. Mann, after evacuants, treats the vomiting and purging of children by alkalies. He gives dilute solutions of carbonate of pot-ash, and mixtures of chalk and magnesia. To these he sometimes adds laudanum, to be taken internally; and occasionally employs the same remedy, and olive oil externally, as he likewise does epispastics. By these means chiefly, with proper attention to food, &c. his practice has been so successful, that out of more than an hundred patients, only one has died, and that one was in a moribund condition when he first saw it.

EASY AND FAMILIAR METHOD OF INSTRUCTING FEMALES IN THE TRUTHS OF EXPERIMENTAL PHYSICS.

By those who entertain elevated ideas of the female character, all attempts to improve and enlarge the minds of the fair sex will be cordially received. In the year 1739, the learned and gallant Algarotti made an attempt to render popular the Newtonian philosophy. This work was published in 8vo. at Naples, in the Italian tongue, under the title of *Il Newtonianismo per le Dame; avvero Dialoghi sopra la Luce, i Colori e l'Attrazione;* i. e. Newtonianism for the Ladies, or Dialogues on Light, Colours, and Attraction. It was dedicated to her sacred Imperial Majesty of all the Russias, in a poetical address of considerable length. The author was complimented upon it by Lord Hervey, Messrs. Symmer and Stillingfleet, and by Lady Montagu. Various attempts have been made, in more recent times, to accommodate science to the taste and opportunities of ladies. Among these, the experimental apparatus and lectures of Mr. Chilton, in New-York, deserve respectful mention. This gentleman has made arrangements for an extensive course of mechanical and chemical philosophy. His discourses are of the popular kind, and are accompanied by pleasing and interesting experiments, divested as much as possible of mathematical and abstract reasoning, and particularly calculated for Ladies. It is to be hoped that a plan which thus blends amusement with instruction, will render many natural phenomena more easy and welcome than if they were explained in a more formal and elaborate manner. And they

who have the education of girls much at heart, will, doubtless, duly appreciate the valuable labours of Mr. Chilton to imbue the female mind with a due proportion of this kind of knowledge, so admirably adapted to enlarge and adorn the mind.

CAN A PERSON UNDERGO THE SMALL-POX AFTER HAVING BEEN ACTED UPON BY THE COW-POCK?

Although this question may affect some of our readers with surprise, it has, nevertheless, been seriously doubted, of late, in the country where vaccination began, whether the cow-pock was an *effectual* and *permanent* safeguard against the small-pox. Amongst various publications intended to show that it ought not to be relied on, there is a *pamphlet by Mr. Goldson*, an inoculating practitioner, which has attracted a considerable share of attention. To the alleged cases of vaccinated patients who afterwards had the small-pox, as stated by Mr. Goldson, there has been given a formal reply by the learned Dr. George Pearson *and his associates, the physicians of the original Vaccine Pock Institution of London.* Their publication is entitled, "A Statement of Evidence from Trials by Inoculation of Variolous and Vaccine Matter," in 87 pages 8vo. and appears to have been published in August, 1804. Cases are related, to the number of sixty, of persons who had suffered cow-pock, and were afterwards found incapable of receiving small-pox by inoculation. Most of them were witnessed by 100 professional gentlemen. Many of the persons inoculated for small-pox had undergone cow-pock from three to five years before. And they were in circumstances the most favourable to the reception of variolous poison. The authors of these *positive* proofs conceive that they have fully shown the complete prophylactic power of the vaccine contagion against the variolous virus; notwithstanding all the doubts expressed and *negative* cases adduced on the other side. By the kindness of the correspondent who sent us, under the seal of the society, the present account of those re-inoculations and their result, we hope to receive shortly a second report, in which the laws of vaccine contagion, as it acts upon the human system, will be further unfolded. We wait with some impatience the termination of these contradictory statements, made by men who seem to be equally desirous of investigating the truth.

PESTILENTIAL DISEASES.

The effects of temperature, and of a particular local constitution of the air, were scarcely ever more forcibly exhibited than in the course of the late season. In the eastern, northern, and middle parts of the United States, the summer was unusually mild and pleasant; while in the two southern States of South-Carolina and Georgia the heat was felt with uncommon severity. The appearance of pestilential diseases corresponded very remarkably with these varieties of temperature in the places just mentioned. The sea-port towns of all the Eastern and Middle States where this mildness of summer heat was experienced, have, without exception, been so fortunate as to escape the ravages of yellow fever. Portsmouth in New-Hampshire, Boston, Providence in Rhode-Island, New-London in Connecticut, New-York, Philadelphia, Wilmington in Delaware, Baltimore, Alexandria and Norfolk in Virginia, and, in a word, all the Atlantic sea-ports to the northward of South-Carolina, in the most of which that disease had frequently appeared on former occasions, enjoyed, during the late season, a happy exemption. In former unfavourable seasons, when any one of the cities now mentioned was affected with yellow fever, it was usual for several of them to be subjected to the calamity at the same time; which appeared to be the effect of a common cause operating over a wide extent of country. On the supposition of the importation of this disease from abroad, the escape of so many sea-ports, in most of which no additional restrictions had been imposed upon commerce, must appear to be a surprising coincidence.

But in the two southern States of South-Carolina and Georgia, and at New-Orleans, where the heat was experienced to a most violent degree, the yellow fever appeared and destroyed many lives. The city of Charleston was affected with it during a considerable portion of the season; but it is asserted that the victims were only found among strangers, or persons whose residence in the place had been short. Our intelligence, however, from all the seats of the disease in the southern parts of the Union, has been hitherto so imperfect that we must defer our details to the next number of the Repository, in which we hope to be able to lay them satisfactorily before our readers.

A malignant disease is likewise said to have prevailed in many parts of the interior country. Reports of this kind have been circulated concerning the county of Delaware in this State, several counties, particularly York and Cumberland, in

the State of Pennsylvania, and some parts of Virginia. We have taken measures to obtain an accurate account of this disease, as it appeared in the several situations just mentioned, and hope to obtain it in time for our next number.

Some cases of yellow fever are stated to have appeared near Bridgeport, on Mill-River, in the State of Connecticut. From all we have been able hitherto to learn, it seems probable that these cases, like those at the Wallabout, near this city, mentioned in our last number, were the result of an accumulation of local filth during one of the warmest periods of the season. Of this, too, we intend hereafter to give a more particular account.

In delineating the character of the season just passed away, it ought not to be omitted that intermittents were extremely prevalent in this city and its vicinity, during the last spring, and throughout the month of June. With the beginning of July the dysentery appeared, and continued to be more or less epidemic till the middle of September. In some parts of the country we learn that this disease raged for many weeks with great violence and mortality. The common observation, that the cholera and diarrhœa of infants are most apt to prevail in the seasons when the yellow fever is absent, and that the former soon give place to the more potent sway of the latter, was strongly verified in the late season. The mortality among infants from cholera and diarrhœa was very considerable.

NEW PERIODICAL PUBLICATIONS.

We observe with great pleasure the appearance of the first number of *The Philadelphia Medical Museum*, conducted by JOHN REDMAN COXE, M. D. of that city. It is intended to be a quarterly publication of more than one hundred pages; so that the four numbers of every year may form a volume of convenient size. The plan of this publication disposes of its contents under two heads: 1st, of *Original Communications;* and, 2dly, of a *Medical and Philosophical Register.* Under each of these heads, this number comprises several very valuable and respectable articles, which have been selected with much care and judgment. And we think the public have reason to augur great usefulness from the continuance of a work conducted with the diligence, zeal, and talents, which are exhibited by Dr. Coxe. The typographical execution is very neat, and entitled to much commendation.

Professor BARTON, of Philadelphia, has issued proposals for publishing a periodical work, to be entitled, *The Philadelphia*

Medical and Physical Journal. It is the design of the Editor that this work shall contain, 1. *Original Communications* relative to all the branches of *Medicine*, *Natural History*, and *Physical Geography*; 2. *Biographical Sketches* of the lives of eminent physicians and naturalists, especially those of the last half of the eighteenth century, and of the present time; 3. *Reviews* of, and *Extracts* from, new publications, in Medicine, Natural History and Geography, especially those which have been published in the United States, or which have a particular reference to that tract of country, &c. 4. *Miscellaneous Tracts* of various kinds, all, however, relating to the expressed objects of the work.

It is the intention of the Editor to make this a semi-annual publication. Each number will contain at least 200 pages, printed on a good type and paper. The first number is now prepared for the press, and will be published early in the month of November. The talents and learning of Professor Barton, and the distinguished reputation which his numerous publications have already acquired, are satisfactory pledges that this contemplated work will be conducted in such manner as to be useful to his country and honourable to himself.

We cannot omit, on this occasion, to congratulate our readers and our country on the evidence which these undertakings afford of the scientific progress and improvement of the United States. It must excite a proud feeling in the breast of every American who knows how to appreciate the value of literature and science, to see our country, young as it still is, advancing by such firm and gigantic steps to rival some of the most important establishments of the European world. For ourselves, we have no doubt, bold as the institution of these publications may appear to some at the present stage of society in this country, that they will succeed well, and completely gratify the enterprising and public-spirited intentions of the Editors. The materials of which they are to consist abound in every community. Observers and recorders of facts are only wanting to collect and prepare for the public eye what is every where profusely scattered. And from the specimens of improvement which our country has exhibited within a few years, it is now no longer doubtful that a spirit has gone forth, and is at this time in active exercise, which will soon renovate the scientific reputation of our western hemisphere, and enroll the people of the United States in the rank of literary nations.

NOTICE OF NEW PUBLICATIONS AND WORKS IN HAND.

Professor RUSH has lately published a fourth edition, with additions, of his "Inquiry into the Effects of Ardent Spirits upon the Human Body and Mind; with an Account of the Means of preventing, and of the Remedies for curing them." A further account of this publication will be hereafter given.

Dr. JOHN RUSH has lately published a pamphlet, entitled, "Elements of Life, or the Laws of Vital Matter." This likewise will be more particularly noticed on a future occasion.

Dr. SHADRACH RICKETSON is engaged in a work on Hygiene, to be entitled, "Means of preserving Health and preventing Diseases, founded principally on an Attention to the Non-naturals in Medicine."

Mr. C. S. RAFINESQUE has been for some time engaged in collecting materials for a Catalogue or Flora of the country for an hundred miles or more round Philadelphia. For this purpose he has already explored the two shores of Maryland, the State of Delaware, and the northern part of Virginia. He is now engaged in visiting the northern parts of Pennsylvania and New-Jersey. Next season he expects to visit the southern part of New-York and Long-Island.

MEDICAL COMMENCEMENT IN DARTMOUTH COLLEGE.

At a commencement held in Dartmouth College, on Wednesday, the 22d of August, 1804, the degree of Bachelor of Medicine was conferred on Abraham Mason and Job Wilson, and the degree of Doctor of Medicine on Lyman Spalding.

FOREIGN.

VARIOUS EFFECTS OF CHARCOAL.

MR. SCHAUB, of Cassel, has made some observations on the use of charcoal, in which the experiments of Mr. Lowitz with this substance are for the most part confirmed. Mr. Schaub employed charcoal with advantage for clarifying different liquors, and it also served to whiten tartarous acid and different solutions of salts. Meat, which had acquired the highest degree of putrefaction, on being rubbed with charcoal powder, lost entirely the putrid stench, and only disengaged the smell of ammonia. Mr. Schaub has preserved

venison for above six weeks in an unaltered state, by covering it with charcoal powder. On adding to honey, dissolved in water, a certain quantity of charcoal powder, it will lose its colour and smell; brandy is likewise deprived of its particular smell by shaking it with charcoal powder, and afterwards distilling it. The residuum of sulphuric ether, on being mixed with charcoal, becomes clear and transparent like water. The odours of several substances, as valerian, galbanum, balsamus Peruvianus, musk, &c. have been diminished, or have entirely ceased by the addition of charcoal powder. Crude tartar, on being boiled with charcoal, yields pure and white crystals.

EFFICACY OF CHARCOAL IN DIFFERENT DISEASES.

Dr. Hunold, in his observations on the use of charcoal in different diseases, has found it of great effect in herpetic exanthemata, particularly those which arise from the frequent eating of salt meat. For this purpose he mixed charcoal powder with as much rum as rendered it of the consistency of a soft plaster, which he applied to the diseased spots, whereby the eruptions gradually dried, and then disappeared. Charcoal powder, mixed with an equal quantity of pulvis cortic. Peruviani, is successfully employed for scorbutic gums, the bleeding of which will certainly cease, and the disagreeable smell of the breath be greatly diminished, by gently rubbing the gums with this powder. He likewise administered the charcoal powder with much success in putrid fevers, in a dose of half a drachm, to be taken six times a day. In foul ulcers of the legs it proved likewise very serviceable, and he found it also to be a useful antiseptic applied on gangrenous parts.

ERRATA.

The reader will please to correct the following errors which occur in the last number of the Repository:

Page 8, line 25, for "affusion," read *effusion.*
9, 29, for "agree," read *argue.*
11, 18, for "cholera," read *chorea.*
12, 13, for "has," read *had.*
14, 21, for "two," read *ten.*
15, 13, for "results," read *result.*